INTERNATIONAL LABOUR REVIEW

The

INTERNATIONAL LABOUR REVIEW

is a monthly periodical, which has been published by the International Labour Office since 1921.

The articles, written by the specialised divisions of the Office and by outside contributors, cover a wide variety of subjects relating to labour and provide a means of following the more important social and economic problems from an international point of view. Summaries of the results of surveys or inquiries and of official reports are also included, together with other documents of general interest and a bibliography.

A supplement, inserted in each number, contains statistics of employment, unemployment, consumer prices, wages, hours of work, etc., and occasional articles on special statistical problems.

The Review *is published in three editions—English, French and Spanish.*

Offprints are made of articles of particular interest that have appeared in the Review.

SUBSCRIPTION RATES AND PRICES

Annual subscription : **$6** or **36s.** *Single copies :* **60 cents** or **3s. 6d.**

Subscriptions may be sent to the International Labour Office (Sales Section) or to the Branch Offices and Correspondents listed on this cover, from which addresses the equivalent prices in other currencies can also be obtained.

Cheques should be made out to the International Labour Office.

A specimen copy of the *Review* will be sent free on request.

All correspondence regarding articles in the *Review* should be addressed to the Editorial Division, International Labour Office, Geneva, Switzerland.

INTERNATIONAL LABOUR REVIEW

VOL. LXXVI—No. 6
DECEMBER 1957

GENEVA
1957

Printed by " La Tribune de Genève ", Geneva (Switzerland).

CONTENTS

Page

Social Problems in Mines Other than Coal Mines 527

The Trade Union Movement Faces Automation, by Alfred Braunthal 540

Reports and Inquiries

Wages and Related Elements of Labour Cost in European Industry, 1955 : A Preliminary Report 558

Shortage of Highly Qualified Engineers and Scientists . . 588

Bibliography

Publications of the International Labour Office 604

Publications of the United Nations and Other Intergovernmental Organisations 605

Other Publications 605

Erratum 619

Volume LXXVI : Contents 620

The **Statistical Supplement** for this month contains tables of unemployment and employment statistics, consumer price indices, and statistics of wages and hours of work.

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Social Problems in Mines Other than Coal Mines

Widely scattered throughout the world, often in remote and otherwise underdeveloped areas, and employing over two-and-a-half million workers, the mining industry, other than coal mining, presents a number of social problems that do not arise in other types of industrial activity or at least arise in a different form there. These problems stem mainly from geographical isolation, instability of demand for mineral products and, especially in underdeveloped areas, high rates of labour turnover and consequent low levels of productivity of the labour force, and the effects of industrial work on peoples who have hitherto had little or no contact with modern society.

It was to provide an opportunity for international examination of these and similar matters that the Governing Body of the International Labour Office decided to convene a Tripartite Technical Meeting for Mines Other than Coal Mines to be held in Geneva from 25 November to 7 December 1957. The article that follows provides a general introduction to the questions that will be discussed at this meeting.

FROM the earliest times, when man sought flints to use as implements, to the present day, when uranium ores are being mined for the production of atomic energy, minerals have played an increasingly significant role in world affairs. There are few aspects of modern life that are not dependent on some form of mineral production, which continues to expand in both volume and variety to meet the constantly increasing demands of science and industry.

Many elements, such as beryllium, cadmium, radium, tantalum and zirconium, for long referred to as " rare ", have now important everyday uses. Several minerals that only some fifty years ago had little commercial value have since entered the widening field of industry. Within quite recent times there has been a phenomenal increase in the production of minerals from which aluminium and magnesium are extracted, to be used in the form of light alloys for the construction of aircraft and other forms of transport. Largely to meet the demand for more and more electrical energy the production of copper has increased more than sixtyfold during

the past hundred years and the output of some other metals to an even greater degree. More than a hundred varieties of minerals are used in modern industry in varying amounts and it would, indeed, be difficult to assess a degree of importance for each. Nevertheless, it can be said that the foundation on which our machine age has been built is iron, and this seems likely to continue to be the core of the pattern of mineral relationships. Its production has multiplied a hundredfold over the last hundred years.

The greatest acceleration in the rate of consumption of metals and minerals has taken place during the present century, which has seen more mineral wealth won from the earth than all preceding history. Further, there seem to be no grounds for thinking that consumption will diminish ; on the contrary the indications, so far as can be foreseen, are that it will continue to increase. It would also appear that resources of most minerals are adequate to meet the anticipated needs over a long period if they can be made available. Mineral deposits, however, are the results of natural geological conditions and have occurred without regard to the convenience of man or his political boundaries. Though practically all countries have mineral wealth to some extent, parts of the earth's crust have been more favourable to deposition. No industrial country has resources for all its needs within its own borders ; and to maintain their industries such countries must obtain supplies of many of their mineral raw materials from others that have resources beyond their own industrial capacities to utilise.

The search for new sources of supply and their development have extended to all quarters of the globe and a substantial contribution to world mineral production comes from countries in which there is little other industrial activity. Thus the mining industry has become worldwide in its scope and its workers include peoples in all stages of industrial and social development, who perform their labours under a great variety of conditions. Of approximately 2.5 million workers[1] known to be employed in the production of minerals other than coal it is significant that nearly 1 million are found in the continent of Africa, some 470,000 in Asia and more than 250,000 in Central and South American countries. In Europe, where mining traditions reach back for centuries, the industry employs nearly 500,000 workers at the present time. The mines of the two great mineral-producing countries of North America—Canada and the United States—together give employment to 250,000 workers and a further 50,000 are found in Oceania.

[1] This and subsequent figures exclude the Soviet Union.

The employment of such a large and heterogeneous labour force gives rise to many social problems. Some of these are common to all forms of industry; but they require different solutions in various countries. Others may be peculiar to mining generally or they may be associated with certain types of mines or particular minerals. They are most numerous and most urgent in the industrially underdeveloped countries, where they have their roots largely in the low standards of living and social development usually found in such regions. Only problems of major importance can be mentioned in this short article, which is particularly concerned with the less-well-developed countries; but, in considering these problems of the industry as a whole, it is well to note some of its technical and economic aspects, which give rise to the wide variation of conditions found in mines and affect their prosperity.

Mineral deposits vary in size and shape from small isolated pockets of ore to huge masses containing many millions of tons. The former are suitable for small-scale working using simple equipment; and they may give employment to only a few miners for a limited time. The large deposits may require a labour force of several thousands of workers and give rise to permanent mining communities. While a characteristic feature of the industry in most countries is the large number of small mines, a greater number of workers are, as a rule, employed by large undertakings. Large surface deposits lend themselves to methods of cheap production by machinery that enables economic use to be made of low-grade ores; the structure of the labour force in these cases differs considerably from that found in underground mines. The mining of underground deposits involves many technical problems not encountered in opencast mines, such as the sinking of shafts and problems of hoisting, pumping and ventilation. There is often much uncertainty attached to these deposits. The mineral veins or lodes may die out or be cut off by unforeseen changed geological conditions. They may persist to great depths, as is the case in Southern India, where gold is being mined on the Kolar goldfield from a depth of over 10,000 feet. The limits to deep mining are most usually decided by economic rather than technical considerations. The chemical structure of the mineral frequently changes in depth and its treatment then gives rise to problems; or the nature of the actual metal may alter. No two mines are identical and the scale of operations and methods of working must be adapted to suit the ground conditions of each deposit. These may vary considerably in individual mines.

Few minerals can be used in the state in which they come from the ground without some form of treatment. Minerals that are important chiefly for their metal content are known as " ores ", in

which one or more metals may be present as chemical compounds. These must be segregated before the respective metals can be recovered, each by separate methods of smelting and refining. Such processes usually require a high degree of technical skill and sometimes years of research have been necessary before a satisfactory method of extraction could be evolved for particularly complex deposits.

Many important mineral products, particularly the base metals, are sold in the open market and are consequently subject to fluctuations in demand and prices ruling at various times. Such fluctuations have often had serious social repercussions, resulting in widespread unemployment due to drastic curtailment of production. Apart from the wider cyclical depressions, short-term fluctuations in price occur which go far beyond the price required to ensure adaptation to long-term changes in supply and demand. Stable marketing conditions encourage long-term planning for both production and investment and assist operating efficiency. Low-grade ores may be rendered uneconomical by a fall in the price of the metal content. Mining conditions may be such that, although the depression is temporary, ore left unworked is not recoverable at a later time and is lost for ever.

Certain other factors may influence the demand for mineral products. Research is constantly being carried on in an attempt to replace rare and expensive materials by others more abundant and more cheaply produced. Plastics, for instance, are often used where tin, copper and lead were previously required. Indeed, industrial progress in all countries would be greatly assisted by the development of new minerals and techniques that would cheapen the cost of production generally and, in particular, provide lighter materials for construction purposes. Improved methods of mining or the development of new processes for the extraction of metals from ores may bring into use large deposits of cheaply mined low-grade ore previously left unworked as uneconomic, thereby seriously affecting existing mines. Lastly, a mineral deposit is exhaustible and the life of a mine is limited ; it is, in fact, a wasting asset from the time it comes into production. These are some of the main factors which bring an element of uncertainty into mining enterprise. While all of them do not necessarily affect every mine, some of them must be taken into account by most mines.

As the supplier of basic raw materials for most other industries, mineral production has a specially important place in world economy, and an essential factor in any plans aimed at its continuity is that there should be an ample and stable force of workers of all grades. It is a matter of concern at the present time, when

the general trend is one of greater demand and expansion, that an increased flow of technical and skilled workers is not readily available. The shortage of technically trained men is being experienced by all branches of industry in most countries. Although universities and technical schools are training more engineers and scientists than ever before, demand continues to outstrip supply as a result of scientific and technical progress and the need for increased operating efficiency. The mining engineer is being called upon to extract metals more economically and in ever-increasing quantities from low-grade ores situated in more remote and inaccessible regions or from greater depths. As these problems increase so does the need for specialised training. Today, mining requires not only trained mining engineers and primary metallurgists but also highly trained geologists, geophysicists, chemical engineers and other expert personnel to take care of the various auxiliary works and planning that have become an integral part of the industry. It also needs more skilled workers to operate and maintain the machinery and mechanical equipment that is being used on an increasing scale.

In industrially developed countries mining competes with other forms of industry in this respect and, since many of these countries are at present enjoying conditions of full employment, workers with a wider choice of occupations open to them may not be readily attracted by the arduous conditions usually associated with mining. This has had the effect of improving the conditions of employment offered to mineworkers generally and of bringing them more into keeping with the importance of the industry than formerly. It has stimulated the establishment of vocational training schemes for workers of all categories and brought opportunities to many of them for technical education to an extent not previously offered by the industry. It has encouraged research aimed at better methods of working, increased mechanisation and the general improvement of mine layout and equipment. While it may take time for such measures to bear fruit there seems to be no reason to doubt their eventual success in countries with well-founded educational institutions and resources of labour with industrial tradition.

Elsewhere, in countries which lack these conditions, the position varies according to the degree of industrial and social development achieved. The extreme case is represented by large mining industries established in remote and thinly populated regions, such as are found in many African territories, by foreign mining companies which have, of necessity, brought their technical staffs and skilled workers from abroad. This usually entails a large shifting of population. The supply of labour may be plentiful ; but, drawn

from indigenous peoples long accustomed to "subsistence" economy in agricultural pursuits, and lacking industrial traditions, the potential workers are restricted to categories of unskilled work. Many of them find themselves earning wages for the first time, in a system which is strange to them, and called upon to perform tasks for which their previous experience has not fitted them. They must be taught to do their simple tasks efficiently and stimulated to acquire the higher skills of their new calling. To ensure their welfare, and that of their industry, it is desirable that they should develop into members of a stable, contented community and learn to take a responsible part in their own industrial and social development. The foundations on which their progress must be built are conditions of employment that satisfy their basic economic and social needs. These, it is generally believed, will encourage them to acquire greater skills, which will in turn increase their productivity and earning power and enable them to attain the higher standards of living so much desired for them. It is the provision of these conditions that gives rise to the major social problems of the industry in the underdeveloped countries.

Many of these problems are concerned with wages, of which perhaps the most important aspects are the methods used in their determination, in particular the minimum wage level and the systems of payment in use. The chief factor influencing the method of wage-fixing in individual mining fields is the extent to which labour is organised, and in most countries with industrial traditions collective bargaining between the miners' unions and their employers' organisations is the normal procedure adopted. There are, however, many parts of the world where mineworkers are not organised, for reasons referred to later, or where trade unions are only in an early stage of development. In some of these countries governments have felt it necessary for reasons of national economic policy to establish some form of authority charged with the responsibility of regulating wages. Where there is no recognised authority wages are fixed by the employer and generally conform to the levels ruling in the country. In countries where wages are exceptionally low and the supply of labour is plentiful, there is a danger that the workers are paid less than their worth to the undertaking and less than it could afford to pay. It is widely felt that the most desirable method of wage-fixing in such circumstances is through wages boards. The inclusion of workers' representatives on such bodies is regarded as an essential feature of their constitution and the experience gained by participating in the work of the boards is valuable training towards the assumption of greater responsibilities by the workers.

While the principle that there should be a level below which

wages should not be allowed to fall is universally accepted and the political and economic aspects of this principle are widely appreciated, there are great variations in practice in the definition of a minimum wage and in the methods employed in its determination. In many countries the legal standards have not been achieved. This is a matter of considerable importance to the mining industry, in which there is general agreement that productivity is closely related to nutrition. Mining, particularly underground mining, is regarded as heavy work and, unless the miner can be ensured a wage that will enable him to maintain and improve his health and strength, his prospects of raising his productivity and standard of living are small. It is felt in many quarters that the accepted standards of the daily requirements of energy from food for men engaged in heavy work should constitute the most important factor in determining the minimum wages of mineworkers in countries of low dietary habits.

In general, the systems of wage payment most used in mining are those based on time and results. Although both systems are widely used in all countries, the former, which has the merit of simplicity, is more readily understood by workers in mining fields where the majority of them are illiterate. For many categories of mine employees—engineers, mechanics, clerical workers and the many miscellaneous occupations—time is the only practical basis of payment and, in fact, the only basis applicable to all categories and all cases. For underground work, payment on a time basis is preferable to contract or bonus arrangements in mines where the minerals are irregularly distributed, requiring discrimination in the separate handling of ore and waste, or in which the mining conditions are difficult, demanding slow and painstaking operation ; both of these objects are likely to be defeated by any system which aims to promote speed.

On the other hand, payment by results has long had successful application in countries with mining traditions. Indeed, it has generally been preferred by the miner whenever conditions have permitted its use. Unlike piece-work in a factory, where a standard rate may be set for all workers engaged on the same task, contract or piece work in mining operations may be complicated by the varying conditions under which it is carried out. From the employer's viewpoint its advantages are that it promotes speed, increases production, saves expense on supervision and reduces unit costs. It allows him to count with certainty on the ultimate cost of a particular job or operation. The worker can reap the reward for skill and energy in the form of higher wages than he would earn on a time basis. The disadvantages are that difficulty is sometimes experienced in enforcing standards of workmanship and the

observance of safety regulations. Disputes frequently arise over accuracy of work measurement and discontent may be caused by misunderstanding the terms of the contract. Perhaps the factor on which agreement is most difficult is the duration of such contracts where ground conditions are variable, and the mine manager may be reluctant to renew terms he feels have proved unduly favourable to the miners. It is common practice, in most countries, for workers to be safeguarded against loss, however, by guaranteed minimum earnings and, where uncertainties exist due to varying conditions, short-term contracts are adopted. For these reasons straight piece-work has been most successfully applied to the various operations concerned with the exploration and development of mineral deposits by boring, sinking, tunnelling, driving levels, raises and winzes and, generally speaking, wherever the size of the excavation is constant, ground reasonably uniform in character and the work readily measured and inspected.

Payment on the basis of an agreed sum per unit of work is being widely replaced by more modern methods, which consist of setting standard performances capable of being reached by an average industrious worker, and with a scale of premiums payable for work done in excess of the standard. It is claimed that these methods overcome the disadvantages of piece-work since, while they guarantee normal wages on a time basis, they provide incentives for increasing earnings by additional effort, standards of workmanship are more readily enforced and the employer shares in the saving in costs.

The various operations referred to above, to which methods of payment by results are applied in mines, actually consist of a series of separate operations—drilling, blasting, removal of spoil, support of the excavation, etc.—which are normally entrusted to gangs or partnerships of skilled, all-round miners. The principles of payment by results are, generally speaking, readily understood by miners with comparatively high standards of living and education. The position is different in the more backward countries with inexperienced workers, often illiterate, whose basic needs are small and where the urge to increase efficiency and earning power has not been stimulated. There is often resistance to change of methods and schemes aimed at increasing their productivity, without which their progress will be retarded. A feature of the structure of the labour force in such countries is the large number of workers in categories of unskilled work. These workers are often migrants who remain in employment for limited periods and are trained for one particular job. Only a small proportion of the total labour force may remain long enough to progress towards the more skilled work. While much can be done in the field of

vocational training, it has been suggested that " a main condition for the successful operation of incentive schemes is the existence of a stable and contented labour force, earning wages reasonably adequate to provide for the requirements of health, decency and working efficiency.... It is only from such a labour force, integrated into its working environment, and with economic, social and cultural needs related to that environment that we can obtain that *insistent and compelling urge* towards higher standards of efficiency, productivity and earning power." [1]

In mining countries that are economically and industrially well advanced, labour-management relations follow established traditions. Mineworkers, generally speaking, are effectively organised and their unions play an important and responsible part not only in determining conditions of employment but in many aspects of the welfare of the workers and the mine ; the workers are aware of the complex problems affecting the industry, and the management understands the needs of the workers and the problems that face them. Where there is no industrial background, traditions take time to establish. Such is the position in many African territories, for example, where much of the mining industry has been developed by overseas companies and where difficulties arise owing to the differences in language, culture and habits between the overseas staffs and the indigenous workers. The social structure in many of these parts is still closely linked with the tribal system in which family ties have overriding importance and individual responsibility is slight. In his first contact with industry the African worker finds himself in a network of relationships that he does not understand and that do not fit in with the world he knows. The mining industry imposes a great strain on these societies when it develops in such countries. Trade unions have been slowest to develop where the mines are small and scattered over a wide area and in many African territories none have yet been formed. Progress in shaping industrial relations has been easier in the larger undertakings, though it has been retarded in many regions by the high turnover of migrant workers. It is found, however, that as the labour forces become stable they are stimulated to organise. The governments of many of these territories have actively encouraged the workers to organise with the ultimate objective of taking their full share in their own industrial and social progress. In this the workers seek guidance from the experience of fully industrialised countries and there is wide scope for assisting their education in these matters.

Much has been done within recent years towards raising the

[1] Colony and Protectorate of Kenya : *Report on African Wages, 1954* (Nairobi, Government Printer, 1954), p. 129.

standard of housing for workers generally and modern housing schemes in industrial areas have been prominent in the housing programmes of many countries. Few mines, however, are developed close enough to existing centres of population from which the labour force may be drawn without the necessity of providing houses at or near the site. The onus for housing its workers does not necessarily rest on the undertaking; only in a minority of countries is this required by law. For most mining companies, however, circumstances are such that they must accept the responsibility at least in the earlier stages of the development of the mine.

The problems associated with miners' housing are many and varied. They include the principles to be followed in the allocation of houses as well as questions of rent, housing allowances when accommodation is not available, charges for lighting and other amenities, arrangements for the purchase of homes in settled communities, the provision of accommodation for single men and retired workers as well as many administrative details. But the most important aspect is the standard of accommodation required. Experience has shown that where conditions are bad there is usually a high turnover of labour; consequently good housing has become widely recognised as a most important factor in the attraction and retention of good workers. It would seem desirable therefore that mineworkers' housing should be at least equal to that available to other industrial workers and conform to the best rules of town planning for layout, comfort, construction and hygiene, according to the standards of the country. It is important that the varying family needs of individual workers should be catered for. Further, it is also widely recognised that healthy mining communities should provide their residents with opportunities for the enjoyment of their leisure and for the pursuit of cultural interests common to normal population centres. There is much evidence of the full appreciation of these principles, not only in well developed countries with a generally high standard of living, but also in many parts where the mining townships are much superior to the general level of housing prevailing. This is true, for example, of the bauxite mines of Surinam, of the Northern Rhodesian Copperbelt and of the Belgian Congo, where spaciously laid out townships, complete with churches, schools, shopping centres, community halls, clubs and other recreational amenities compare favourably with towns of equal or even greater size in well developed countries. Not all mining companies, however, have the financial resources or the ore reserves for long-term operation to provide and maintain such standards and it is known that housing conditions on mines in many parts of the world are below desirable standards.

Mining requires a high standard of physical fitness and general

health in its workers. Work below ground may have to be carried out under conditions which, unless carefully controlled, may have adverse effects. Not only do bad conditions impair physical ability and comfort; they also increase the risk of accidents. It is necessary, therefore, that measures should be taken to safeguard the miner against the ill-effects of such conditions as well as against certain diseases and disorders to which he is exposed in the performance of his work. It is desirable that recruits to mining should be medically examined to ensure their fitness for the work on which they are to be engaged, and further, that they should be examined periodically afterwards so that signs of adverse effects of their working conditions may be detected before serious injury to their health results. Mines must be kept clean and the provision of efficient sanitary conveniences is an important requisite. There should also be a plentiful supply of good drinking water close to the working places. The provision of accommodation where the miner can change into and out of his working clothes and enjoy a bath immediately on his return to the surface is desirable and, in some cases, required by law. One of the main problems in mining practice is the difficulty of obtaining a healthy atmosphere in underground workings; essential to good working conditions is a ventilation system which will provide and distribute an air current of sufficient volume and velocity to supply the needs of the workers for clean air, absorb water vapours and heat, remove the fumes caused by blasting and emanations of various gases from the strata, and dilute and remove airborne dust.

Of the general disorders to which the miner is particularly exposed by far the most important are pneumoconiosis and silicosis. The latter has given rise to a rate of mortality far greater than that caused by mining accidents and it has taken a heavy toll among goldminers in particular. While silicosis is the most prevalent form of lung disease in miners, it should also be noted that dusts from certain ores and minerals can give rise to equally grave disorders owing to their toxic effects. In mining cinnabar, the ore from which mercury is extracted, great care must be taken to prevent poisoning and the same applies to the mining and treatment of arsenical ores. Precautions must also be taken to prevent lead poisoning, either by inhalation or through the mouth, in the case of ores containing lead carbonate. Asbestos dust is particularly dangerous and the effects of inhalation of dust from pyrolusite (manganese ore), which attacks the nervous system, can cause serious disorders. The dangers associated with radioactive metals are well known and special precautions must be taken in mining uranium, thorium, actinium and similar ores.

The elimination of the dust hazard and the prevention of

pneumoconiosis are of fundamental importance to the health of miners. The measures by which dust prevention and suppression are achieved belong to the technical aspects of mining and the responsibility for their application is primarily that of management. In most countries the mining regulations prescribe minimum standards, but in many cases difficulty is experienced in their enforcement. The co-operation of all workers is essential and they should be fully instructed on the subject of dust, its dangers and suppression. While much has been done within the industry to improve the conditions under which miners must work and to protect them from the risks to which they are exposed, the steady expansion of mining in non-industrial countries is constantly extending the field for further activity. Particularly in regard to education in health matters the medical and health services in countries where the industry is well organised are frequently of a very high order and are often organised on an industry-wide basis. There is great need, however, for such services to be made available to the many thousands of miners employed in small undertakings in countries where medical services in general are inadequate for the areas they serve. There is an equally urgent need for better facilities for the treatment of those who have become incapacitated by disease.

Perhaps it is in the sphere of social security that the conditions of mineworkers vary most widely in countries at different stages of economic development. Most industrially well organised countries have adopted general schemes covering all workers for many contingencies but more particularly for occupational accidents and diseases, sickness, invalidity, unemployment and old age. In many of these schemes, in countries where the industry is of special importance in the national economy or where it is intended to attract workers to the industry, mineworkers enjoy a degree of preferential treatment in the form, for example, of pensions at an earlier retirement age than applies to workers generally or of a higher rate of pension. In some countries there are special schemes for mineworkers only. Several of the underdeveloped countries and many of the non-metropolitan territories have not, as yet, been able to establish such protection for their workers. Many of the larger mining undertakings in such areas have instituted their own pension or gratuity schemes in addition to voluntarily providing full medical services for workers and their families. This often imposes a heavy financial burden on a mining company operating in a region where no other medical services are available.

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While many of the economic and technical problems associated with mining have been the subject of international discussion and

action on numerous occasions, little has been done at this level regarding the social problems of the industry as a whole. Although a number of international Conventions concerned with industrial social policy and problems have reference to mines and other workings for the production of minerals, and they have general application in many mining countries, none has yet been adopted which is concerned exclusively with mining other than coal mining. It is therefore especially noteworthy that, for the first time, the social problems of the industry will be the subject of discussion within the framework of the International Labour Organisation at a meeting to be held in Geneva from 25 November to 7 December 1957.

The decision to convene this meeting was taken by the Governing Body of the International Labour Office at its 129th Session in 1955 following its consideration of requests from the Miners' International Federation and the World Federation of Trade Unions for the formation of an industrial committee of the I.L.O. for mines other than coal mines. In support of their requests both organisations emphasised the importance of the industry in world economy, the extent to which it provides employment and the need for improving the living and working conditions of mine-workers in many parts of the world. The meeting will be attended by representatives of governments, and employers' and workers' organisations from 25 countries in whose economies mining occupies an important place. The agenda of the meeting is as follows :

1. General examination of the social problems arising in mines other than coal mines.
2. Accident prevention in mines other than coal mines.
3. Machinery for wage-fixing and wage protection in mines other than coal mines.
4. Industrial relations in mines other than coal mines.

In accordance with practice normally adopted for such occasions, the International Labour Office has prepared a series of reports covering the above subjects which should provide a basis for wide discussions that will also take into account workers employed in the processes for the treatment of minerals in so far as these are performed at or near the mine. The brief and broad references given above to a few of the major problems within the industry can give only an indication of their scope and variety. There is a wide field for discussion and this meeting may show the extent and the lines on which further study and action may be considered desirable.

The Trade Union Movement Faces Automation

by

Alfred BRAUNTHAL

Head of the Economic and Social Department, International Confederation of Free Trade Unions

It is impossible to foresee with any degree of certainty all the social changes that will result from the spread of automation. But one thing is certain: that the attitude adopted by the trade union movement towards these changes will have a decisive influence on social evolution over the coming years; and since 1955 various international trade union organisations have issued resolutions, statements and reports devoted to this important question. In the article that follows, Mr. Braunthal first draws on a number of these documents [1] in an attempt to outline the policy adopted in this regard by a large section of the trade union movement, and then makes some tentative, and necessarily speculative, forecasts of the possible effects of automation on the structure of the trade unions themselves.

THE rapidity and determination with which unions in the most affected countries and industries have taken a position towards the social problems involved in automation and other recent technological developments are a highly significant indication of the importance which the trade union movement attributes to these complex problems. A number of trade unions have issued statements [2] dealing with automation, preluded or accompanied by

[1] See the list given by the author below. It may be interesting to mention in this connection the resolution on automation adopted by the Council of the International Federation of Christian Trade Unions at its 24th Session held in Cologne on 6 and 7 December 1956 (see *Industry and Labour* (Geneva, I.L.O.), Vol. XVIII, No. 8, 15 Oct. 1957, pp. 322-323).

[2] These trade union pronouncements included the statement issued by the I.C.F.T.U. requesting the United Nations Economic and Social Council to place the economic and social problems of automation on the agenda of a session of the Council (Feb. 1956), as well as a brief statement on automation adopted by the Fifth I.C.F.T.U. World Congress (Tunis, July 1957); statements submitted by American trade union leaders to the Sub-

articles in the trade union press (especially in that of the United States), by the resolution on automation adopted by the 39th Session of the International Labour Conference [1], and by a general public discussion. In that discussion the *International Labour Review* participated with three articles [2] and the Director General of the I.L.O. with his Report to the 40th Session of the International Labour Conference [3], the first part of which dealt most comprehensively with the " labour and social implications " of automation and other technological developments that are of interest to trade unions.

Some of the statements referred to above were based on an analysis of the problems involved in automation, others contented themselves with emphasising trade union views on, and demands concerning, certain aspects of automation; but all of them were in broad agreement on the position adopted towards the economic and social problems that have resulted or are likely to result from the introduction of those technological innovations which are generally meant by the term " automation ".

This agreement is so striking that in the following survey of the views held by these trade unions, as they can be inferred from their statements, there will be no need to specify in each case in

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committee on Economic Stabilisation of the Joint Committee on the Economic Report of the United States Congress in 1955; papers delivered at the National Conference on Automation convened under the auspices of the C.I.O. (Apr. 1955); contributions to the automation discussion published by the German Trade Union Federation (in a pamphlet *Gewerkschaftliche Beiträge zur Automatisierung*); a report on the social effects of automation approved by the I.C.F.T.U. European Regional Conference in Frankfurt (May 1956); a resolution on automation adopted by the Third Conference of the Automative Department of the International Metal Workers' Federation (May 1956); a resolution adopted by the General Council of the Confederazione Italiana Sindacati Lavoratori (June 1956); a report submitted by the General Council of the British T.U.C. to its 88th Annual Congress (Sep. 1956); a Belgian joint union-management statement (Oct. 1956); a resolution on automation adopted by the International Conference of Bakery, Confectionery and Flour Mill Workers (International Union of Food and Drink Workers' Associations) in April 1957; articles on automation by representatives of Canadian, German, French, Dutch, British, Italian and Swedish trade unions, which appeared in the official organ of the I.C.F.T.U., *Free Labour World* (May to Sep. 1957); and a resolution on automation adopted by the Congress of the International Federation of Building and Woodworkers (Sep. 1957).

[1] See *Official Bulletin* (Geneva, I.L.O.), Vol. XXXIX, 1956, No. 2, p. 64.

[2] See H. de BIVORT: " Automation—Some Social Aspects ", Vol. LXXII, No. 6, Dec. 1955, pp. 467-495; " Automation: A Brief Survey of Recent Developments ", Vol. LXXIV, No. 4, Oct. 1956, pp. 384-404; and James BURTLE: " Automation, the Guaranteed Wage and Hours of Work ", Vol. LXXV, No. 6, June 1957, pp. 495-513.

[3] *Report of the Director-General*, Report I, International Labour Conference, 40th Session, 1957. Part I: *Automation and Other Technological Developments. Labour and Social Implications* (Geneva, I.L.O., 1957).

which of the numerous trade union statements or articles emanating from trade union sources any particular point was emphasised.

A Positive Approach

The trade union movement is not in principle opposed to automation, nor, indeed, to technological advance in general. Improvements in methods of production, especially such far-reaching improvements as those involved in automation, present opportunities for raising living standards, and the trade union movement welcomes such opportunities. This positive approach to automation is perhaps the most striking feature of the trade union position. But it should by no means be thought that the movement will accept automation, or other technological changes, unconditionally. Automation will be accepted and even supported by trade unions if, and only if, its introduction really provides an opportunity for raising living standards. Trade unions can never accept any reductions in the remuneration of labour or any curtailment in employment opportunities. If any technological change involves either of these sacrifices the trade unions will vigorously oppose it. Technological changes must, they insist, be made in conditions of full employment and of guarantees for the income of labour. It is with this very important fundamental reservation that the trade union movement approaches automation in a positive way: as an opportunity for improving living standards.[1]

The definite conditions formulated by trade unions for the acceptance of labour-saving technological methods must therefore be considered not as reservations intended to block technical progress but as essential social safeguards which are indispensable in any community aware of its social responsibilities.

The Basic Condition: an Economy of Full Employment

It has often been claimed that in a dynamic economy technological progress, far from causing unemployment, contributes to creating employment. This view overlooks the fact that a dynamic economy is not necessarily a stable one that would permanently ensure the full use of all its productive forces, including manpower. Long-term economic expansion does not by itself eliminate a cyclical alternation of periods in which all productive capacities are fully used and rapidly increased and of periods of recession in which

[1] The particular problems of densely populated, economically underdeveloped countries with their huge proportion of unemployed and underemployed workers, which are reflected in the position of trade unions in these countries towards questions of technological unemployment, are too vast to be dealt with in this context.

a large part of the productive factors remain idle. This alternation of booms and depressions was in fact a characteristic of the free market economy of the industrial countries until they began to gear their economic and social policies towards an economy of full employment.

What underlies the optimistic view about the employment effects of automation, often expressed in the public discussion of this subject, is the conviction that the industrial nations will always be able to maintain an economy of full employment. To the extent that this conviction reflects a firm determination to pursue full employment policies consistently, it is of course highly commendable ; but it appears useful in any event to spell out this policy requirement expressly, that is, to state as clearly as possible that the introduction of automation—as well as of other technological processes which tend to displace or dislocate manpower—is socially acceptable and progressive only if it is coupled with a consistent and systematic policy of full employment. This statement would be a commonplace were it not for the fact that influential views are heard from time to time indicating a certain opposition to full employment policies, either because they may contribute to strengthening the trade unions' bargaining power or because of the alleged inflationary effects of such policies.

Full employment policies, as generally understood, will ensure the eventual absorption of displaced workers, but they cannot prevent displacements resulting from technological changes, with all the serious consequences which the loss of a job has for the worker concerned. Trade unions have established a comprehensive programme of measures designed to mitigate the impact of such technological displacements.

The Employer's Responsibilities

Management-Labour Consultation

The primary point of this programme is the requirement of management-labour consultations. This requirement is of course by no means new. Joint consultations on plant and company levels about any technological and other changes immediately affecting workers have become the backbone of sound management-labour relations. Where such revolutionary technological changes as the introduction of automation are concerned, the need for consultation, beginning at the very first stage of planning for its introduction, is particularly imperative. Any secrecy about such plans, any sudden introduction of automated processes, any lay-off of employees without advance consultation of the workers and their trade unions would disturb management-labour

relations most gravely and, as has already been proved by experience, may lead to labour unrest and labour conflicts. Management-labour consultation obviously has to cover the whole range of questions involved in the introduction of automation, such as the planning and the timing of the introduction of the new machinery, and the problems of shifting workers to other jobs, of retraining or discharging them and of changes in job evaluation and wage systems.

The Displacement of Workers

On the major problems of the displacement of workers the views of the trade unions can be summarised as follows:

Where a worker, as a result of the introduction of automation, cannot—for the time being or permanently—be kept in his job, he should wherever possible be placed in another position not inferior to his old one, in the same plant or in another plant belonging to the same enterprise. There may even be joint agreements with groups of enterprises providing for the transfer of displaced workers to another enterprise within the group.

Seniority rules should be widened to entitle workers to transfers of this kind or, in the case of lay-offs, to priorities in re-engagement. Where a removal from one town to another is involved, removal allowances should be paid by the firms concerned.

To be sure, where such thorough technological changes as the introduction of automation occur in whole industries, prospects for shifting many workers within plants or enterprises or groups of plants, without changes in their jobs, are not too bright. Where such shifts are impossible, the first responsibility of the employer will have to be the retraining of workers threatened by displacement for other jobs within his plant or enterprise. During the retraining period the workers should not suffer any loss of wages.

Only where retraining within the plant or enterprise also proves to be impossible, either because openings for which these workers can be retrained are not available or because a worker cannot be retrained because of age or for other reasons, should the employer have the right—after an ample period of notice—to call upon the community to play its part in the solution of this problem. Even so he should share these responsibilities by agreeing to dismissal pay and to annual guaranteed wage plans.

Trade union demands for introducing these two provisions have been growing in the last few years and have been successful in some instances. It is understandable that in this period of swiftly changing technological conditions these demands should become more and more pressing. It is indeed entirely justified

to insist that, especially in periods in which management can be expected to derive considerable benefits from technological changes while individual workers may suffer severe hardships, employers should be committed to share in the financial burden resulting from displacement by giving the workers a measure of income security. Moreover, if all the social expenses resulting from displacements were to be borne by the community and none by the employer, the cost calculation for investment in automated processes would be falsified. If the entire social cost was borne by the community, none would enter into the calculation of the employer. Investments that might be highly profitable from the point of view of the employer might be unprofitable and even wasteful from that of the national economy.

Responsibilities of the Community

The responsibilities of the community in this critical period of rapid technological change—which some authors have given the rank of the Second Industrial Revolution—are twofold: to reduce to a minimum the hardship that workers may face as a result of displacements and dislocations of industries, and to prepare the young generation for the new industrial world they will enter.

Displacements, Dislocations, Retraining, Pensions

The most elementary responsibility of the community towards the displaced worker is, of course, that of assisting him to find a new job and, where that should not be possible immediately, of guaranteeing him in the meantime an adequate minimum standard of living. To discharge the former responsibility an adequate system of employment information and of job counselling is required. To meet the latter, an effective unemployment insurance system is needed. The logical application of the same principle requires that the community should also bear the expenditures for the removal of the worker and his family to any other town if that should be necessary for his switch from one job to another.

As long as geographical shifts are confined to individual workers, the responsibility of the community may be discharged by the assumption of removal expenditures. However, in countries in which there is an acute housing shortage any removal of workers' families may involve a housing problem; wherever large-scale shifts of industries occur in connection with technological changes, housing problems will obviously be aggravated and other serious social problems may also arise. There is the danger that depressed areas may be created at the same time as areas with rapidly

expanding industries experience shortages of housing, schools and other public facilities that will require swift and systematic community action on a large scale.

It cannot yet be foreseen what dimensions such shifts of populations, desertions of old industrial areas and growth of new industrial communities will assume. The fact should be kept in mind, however, that this trend is likely to be strengthened by the development of atomic energy resources. In the interest of safety—if for no other reason—power reactors have to be constructed at great distances from large population centres; it will be unavoidable that at the site of large power reactors communities of a moderate size will develop. It follows that, as a result of the simultaneous growth of atomic energy and of automation, industrial countries may be faced with all those serious economic, social and cultural problems that are involved in large-scale population shifts and in the decline of some towns and the growth of others.

Another problem which the community will have to face is that of providing for adequate retraining facilities. Displaced workers whose skills, as a result of technological changes, cannot be used are not only threatened by an extended period of unemployment but may in addition have to face a downgrading in skill and income scale, unless they are offered, at the expense of the community, adequate retraining facilities, especially in the skills required for the new technological methods.

Not all workers can be retrained or have a chance of finding suitable employment after having been retrained. Among older workers particularly, a certain number might lack the ability to switch to new skills, to be trained in the new technological methods, or simply to stand the nervous or psychological strain that automation may cause. Here again a communal responsibility arises. Regardless of whether or not there is a need for a general lowering of the retirement age, displaced workers unable to retrain for other skills, or to find suitable jobs on the basis of their own skills, should be given the opportunity to retire at an age somewhat lower than the general retirement age, or, if they accept jobs involving a certain downgrading or part-time employment, should be entitled to receive a part-pension.

The New Educational Tasks

The responsibilities which the community has to shoulder in this automated and atomic age for the proper preparation of the young generation for its new tasks are great. For workers who have practised their skill for many years the possibilities

of retraining for new skills may be limited. The young generation, however, should be given every opportunity to participate fully with all their abilities in the new technological age. Their whole education and occupational training should enable them to gain a full understanding of the new scientific and technological foundations of our age. This is no mean task ; to accomplish it the whole educational system, from the universities, colleges, professional and high schools down to the elementary schools, must be geared towards educating the educators, the students and the pupils in the new disciplines.

That an intensification in the mathematical and natural-science disciplines, particularly physics and chemistry, will be necessary in the first place is quite obvious. It would, however, be disastrous for human civilisation if the education of the young generation were one-sidedly directed towards the natural sciences and industrial techniques, at the expense of the humanities. If we do not want our children to become robots, slaves of the machines they operate, we must convey to them the spiritual, intellectual, political and artistic values of our civilisation. In other words, we must not " displace " the humanities from our educational institutions, but must keep them fully alive and add to them that mathematical, physical, chemical, and other technical education and training which is needed in our age.

A full education programme in the humanities and natural sciences will also be needed in order to prepare the young generation for a creative use of the lengthened leisure time which can be expected to be one of the results of the new technological processes.

Trade union statements on automation have not yet specifically referred to the need for fully maintaining education in the humanities while enlarging that in the natural sciences ; but they have made two demands which are connected with this problem : that the general school-leaving age be raised to 16 years or over where this has not yet been done, and that all those capable of and interested in higher education should be given access to it. If the school programme is to be widened without impairing the humanistic disciplines, it will indeed become imperative to raise the school-leaving age and to facilitate access to higher education.

Can Society Shoulder the New Burdens ?

Can society shoulder all those heavy burdens with which it will be loaded by the tasks of assisting displaced workers, retraining them, healing the wounds of industrial dislocations, expanding the scope of education, and raising the school-leaving age? The answer to these questions depends on several factors.

First of all, the ability of the community to bear these burdens will obviously depend on the size of the benefits which the national economy as a whole will derive from the new technological developments. Against the cost of the measures which in the opinion of the trade union movement are essential, the increase in productivity has to be set. If this increase falls short of the cost of these measures, the conclusion must be drawn that there is no net benefit, from the point of view of the community as a whole, in introducing automation. This calculation of the social cost and benefits of technological changes may differ from cost and profit calculations of any major enterprise, but it is in the last analysis the only calculation which matters from the point of view of the community as a whole.

A second factor closely connected with the first one is that of employment policies. If the community is determined to maintain full employment in the face of all technological displacements, its prospects of coping with all its new social and educational tasks will be much brighter than they would be if, for lack of full employment policies, large-scale dismissals could not be absorbed.

The Distribution of the Benefits

A further factor which will affect the ability of the community to deal with its new tasks is the distribution of the benefits arising from the technological innovations. Where these benefits spread to all social strata, through price reductions and wage increases, tax yields will rise and make the financing of the necessary social measures easier. Even in that case, however, there may be a need for heavier taxation. Where, however, benefits are confined to a few industries, and particularly where monopolistic tendencies are strengthened in those few industries, with the effect that the spreading of the benefits to the general public is hampered, the community will face a much more difficult task and particular tax policies might become necessary to ensure that it shares in the benefits.

In any event, to enable the community to meet all the heavy duties which the new technological age will heap upon it, the communal spirit of the citizens will have to be strengthened. First of all, they will have to be ready to place an adequate proportion of the benefits arising from higher productivity at the disposal of the community. Trade unions have done much to strengthen the understanding of the public for the financial needs of the community in our age, which has not ceased to add continuously to the social, economic and cultural responsibilities of the community. While trade unions will at the same time insist that taxes must be levied in accordance with the ability to pay, that is, on the basis of as

progressive a scale as possible, they will realise that, regardless of the distribution by income classes of the tax burden, the share of the individuals in the benefits of increased productivity will have to be curtailed in the interest of the community.

Apart from the problem of the community's share in the benefits arising from the technical innovations, what prospects are there for a comparatively equitable share by all social strata in these benefits ?

As has been indicated above, much may depend on the effect of automation on the concentration of capital. As is well known, opinions about this effect vary. It is not the place here to recapitulate all the considerations which militate for or against the assumption that the concentration of capital, and in its wake monopolistic tendencies, will grow. It is sufficient to state that trade unions can be counted upon to strengthen those forces which, in the case of a growth of monopolistic tendencies, will insist upon the sharpest governmental control over monopolies in order to prevent the abuse of their economic power.

It is no less an established policy of trade unions, which has been confirmed in their statements on automation, that consumers should adequately share in the benefits resulting from increased productivity, by way of price reductions.

Wage Policies

While trade unions agree that the consumers and the community should share in the benefits derived from automation, they most strongly insist that the workers themselves should receive their proper share. This principle, which is in line with long-established trade union policies with respect to any benefits resulting from increases in productivity, applies most immediately to the workers in the automated plants themselves. But while the enunciation of this principle is simple, its application is extremely complicated in the case of automation, where the whole wage structure which has been established by collective agreements, often after years of strife between management and unions and of difficult and involved negotiations, may be revolutionised.

First of all, automation is likely to affect the whole system of job classification and job evaluation. Management and trade unions will have to examine very carefully what changes in these systems would be warranted. But it is likely that among trade unions the general tendency will be towards pressing for a widening of job classifications and a thorough revision of job evaluations.

Simultaneously, profound changes in wage incentive systems can be expected. Where the rhythm of a machine or of a set of

machines is no longer determined by the worker but by an automated mechanism, there is not much opportunity for piecework rates or for premiums based on the volume of individual or team production. These wage methods will obviously recede in favour of either straight-time wage rates or of incentive systems based on new criteria, such as the degree of utilisation of a machine or of an integrated set of machines.

Yet to whatever extent existing wage systems may be affected by the introduction of automation, trade unions will always insist first of all that the workers' earnings on new automated jobs must exceed those on their old jobs, even if incentive wages are replaced by straight-time wages. Furthermore, whatever complications may arise where entirely new skills or where lesser skills are required than heretofore, ways and means will have to be found to apply this basic principle. In the same way, trade unions will maintain that in view of the increased productivity of the entire plant, wages of workers on non-automated jobs will also have to rise.

Hours of Work

It is an established trade union policy to demand that part of the benefits which have resulted from general increases in productivity throughout the industrial age should be paid out to the workers in the form of reductions of their hours of work. The formula " shortening of working hours without reducing weekly earnings " usually means that workers want to receive a certain part of the benefits from higher productivity in the form of leisure rather than in wages. However, in those instances in which the productivity of labour rises as a result of the shortening of hours the increase in leisure may not be bought at all at the expense of the workers' earnings.

It is generally recognised that increases in the productivity of labour as a result of shorter working hours are the more likely the longer working hours have been, or the less likely the shorter they have been. However, in the case of automation, there may be many instances in which, due to an increase in nervous or psychological fatigue, a shortening of working hours may favourably affect the productivity of labour even where hours of work were already comparatively short.

In the last two years—especially since the I.C.F.T.U., several international trade secretariats and national trade union organisations called for a general reduction of hours of work, with the 40-hour week as a goal in those countries in which at present the working week is still above 40 hours—trade unions in many industrial countries have waged a vigorous, and in most cases successful,

campaign for the reduction of hours of work (or for longer vacations with pay), either on the grounds that part of the benefits derived from increased productivity should be reflected in an increase in leisure, or on the grounds that the increased industrial strain requires greater leisure and that consequently shorter working hours would favourably affect the productivity of labour.

It can be safely assumed that the progress of automation will strengthen the trade unions' drive for shorter hours of work and for longer and more frequent vacations with pay. In addition, where displacement problems are particularly grave, trade unions may demand that hours of work be reduced as a transitional measure, that is, as a method of work-sharing in the adjustment period.

Effects on the Trade Unions

Training Tasks

It is obvious that the trade unions, no less than management and the community as a whole, will have to gird themselves for the new tasks they have to face. There are, first of all, many technical tasks for trade unions in industries immediately affected by automation. All the changes in job classification, job evaluation, the placement of workers, retraining on the job and wage systems to which reference has been made above will require the most careful study and preparation on the part of the trade unions and the workers' representatives in the plants. Not only will the unions have to give their officers, the workers' representatives in the plants, and as far as possible the workers in general, a technical training for these tasks ; not only may a certain technical training for an understanding of the new technological processes prove desirable—but trade unions will also have to consider the desirability of a broad education of their officers, of workers' representatives in plants and of the membership at large for an understanding of all the important economic and social problems involved in the great industrial innovations of our age.

Effects of Shifts in Manpower Structure

But what about the trade unions themselves ? Will not their very structure be affected by changes in the manpower structure that are likely to arise from all the technological and industrial innovations now in the process of being introduced or of finding an ever-widening application? While it is difficult to make any predictions in this field, certain long-term trends in the structure of industrial manpower can be foreseen. To illustrate these trends by an example, it is obvious that the ratio of managerial workers,

engineers and technicians, designers and planners, supervisors and foremen to manual workers, needed indirectly and directly for the production of, say, a unit of kilowatt-hours is much greater if this unit is generated by a power reactor than by coal. The same holds true for many other production processes and above all for automated methods of production.

It is well known that shifts in the structure of industrial manpower in two directions have actually been going on for a long time : shifts from unskilled to semi-skilled and skilled workers on the one hand and from manual to non-manual workers on the other. As an example of the shifts within the category of manual workers, the United States Census figures show for the period from 1910 to 1940 an increase in the number of skilled workers and foremen from 4,364,000 to 6,105,000 or 39.9 per cent. and in the number of semi-skilled workers from 5,489,000 to 10,918,000 or 98.9 per cent., while the number of " labourers except farm " virtually stagnated ; it increased only from 5,462,000 to 5,566,000, or 1.9 per cent. In the period from 1940 to 1950, the number of " operative and kindred workers " increased from 8,052,000 to 11,140,000 or 38.4 per cent. while the number of " labourers except farm and mine " rose only from 3,123,000 to 3,431,000, or some 10 per cent.

As an indication of the proportion of non-manual to manual workers, the United States Census of 1950 reported that in the category of salaried employees and wage earners the number of " professional, technical, and related workers ", and " managerial, administrative, clerical and related workers ", was 13,601,000 while the number of " craftsmen, production process workers and labourers not elsewhere classified ", " workers in mines, quarries and related occupations " and " workers in operating transport occupations " was 20,499,000.[1] The ratio of non-manual to manual workers in the category of salaried employees and wage earners was thus 66.4 to 100. In other words, even before the impact of automation was felt there were already in the United States two non-manual to three manual workers. Likewise Canada, with a structure in the industrial sector of the economy similar to that of the United States, showed for the above-mentioned categories of salaried employees and wage earners a ratio between non-manual and manual workers of 63 to 100, while in other industrial countries that ratio was not yet as high, indicating an earlier stage in the shift from manual to non-manual workers. Data compiled from the United Nations *Demographic Year Book* show for the years 1950 or 1951, for the above-mentioned categories of salaried employees and wage earners, a ratio between non-manual and manual workers

[1] The categories " sales workers " and " service workers " are not included in these figures.

of 45.6 to 100 in the United Kingdom, 48.7 to 100 in Sweden, and 39.9 to 100 in Austria. However rough these data are, however inexact for the measurement of the ratio of industrial non-manual to manual workers, the trend itself and its extent, with all the sociological consequences it implies, are unmistakable.

There cannot be the slightest doubt that all these shifts in the structure of manpower from unskilled to semi-skilled and skilled workers and from manual to non-manual workers, which have been going on for a long time, will be strongly accentuated by the spread of automated methods. To a certain extent automation is even likely to blur or eliminate entirely the differences between manual and non-manual workers.

Automation has, on the other hand, an unfavourable, sometimes perhaps even disastrous, effect on the employment of office workers. It seems that the displacement effect of automation on these workers, whether in manufacturing or transport, in banking and insurance, or in trade, is likely to be no less pronounced than that on many production workers. In other words, automation is likely to bring about considerable shifts not only in the proportion of non-manual to manual workers but also within the category of non-manual workers. In contrast to the ever-growing demand for managerial, engineering and technical personnel, that for office workers is likely to decline drastically wherever automated methods invade offices, and grave displacement problems may affect this category of workers, especially older office workers.

In industrially advanced countries the bulk of the membership of the trade unions has always been formed by manual workers, especially in manufacturing, mining and construction. In the history of European and North American trade unionism the manual workers in these trades were the first to organise, and the whole ideology, and even the phraseology, of the movement reflected this origin. In later periods other categories of workers organised. But while trade unionism was spreading from manual workers in manufacturing, construction and mining to many other economic activities and to non-manual workers, the centre of gravity has remained the manual workers. However, with the declining proportion of manual to non-manual workers it has become more and more important to the trade union movement to accelerate the process of organising non-manual workers in order to maintain both its bargaining power and its over-all economic, social and political power. Yet while it is important to do so, it is not always quite easy, for various sociological and psychological reasons that cannot be discussed in the framework of this article.

Thus, while the shift from unskilled to semi-skilled and skilled workers has generally favoured trade union organisation, that from

manual to non-manual workers may have different effects. It can indeed be assumed that the job of maintaining and increasing the numerical, social, economic and political strength of the trade union movement in the industrially advanced countries may become more arduous the more the ratio of non-manual to manual workers shifts in favour of the former group.

This task might be facilitated to the extent that the concept of the " worker " is widened. In the English-speaking countries this process seems to be helped by the spirit of the language itself. While officially a difference is made between " salaried employees " and " wage earners " and while this terminology marks indeed a technical difference between these two categories of employees which reflects certain social differences between them, the term " worker " is not considered as identical with that of the " wage earner ". The wide use and the popularity that the term " white-collar worker " has found, as well as the general use of such terms as " social worker ", " research worker ", etc., indicate clearly the degree to which the meaning of the term " worker " has widened. In other languages, such as German, the linguistic differences between the terms *Arbeiter* (worker, wage earner) and *Angestellter* (salaried employee) are still maintained, in spite of the use of such terms as *geistiger Arbeiter* (intellectual worker), a fact which is doubtless indicative of the consciousness of a social stratification.

Whatever the semantic situation and whatever the sociological situation that may underline these semantic facts, there are indications that, as has been mentioned above, the new technological trends, in the first place automation itself, will have the effect of speeding up the process of blurring—and finally perhaps blotting-out—the differences between manual and non-manual work, at least in certain fields. Moreover, a large part of the trade union demands connected with the introduction of automation, such as lengthening of the period of notice, the guaranteed annual wage, dismissal pay, shortening of the work week and lengthening of vacation with pay, will have the effect of substantially diminishing certain significant differences in industrial relations between salaried employees and wage earners. The changes in wage systems that can be expected, especially the decreasing use of piecework wage rates, will have similar effects. The training and education programmes proposed by the trade unions point in the same direction. Any increase in the school-leaving age, any lengthening of the duration of schooling and professional training, any intensification and deepening of school programmes applying to all children, and any widening in the access to higher education, are likely to have the effect of diminishing the differences in the intellectual training of non-manual and manual workers. It should be

emphasised, however, that, regardless of whether or not and to what extent such sociological trends emerge, the need for the trade unions to organise all those employed in the production process, no matter what their functions in this process, will make itself more and more felt.

This may have consequences for the structure of the trade unions which cannot yet be foreseen. Will it be easier to organise in craft organisations non-manual workers who work in an automated plant and to bargain for them separately, or to organise the plant as a whole and make it a bargaining unit ? Sociological and psychological factors may in certain circumstances militate in favour of the former union structure, technical factors in favour of the latter. On the other hand, if the assumption holds true that the differences between salaried employees and wage earners show a tendency to diminish, the sociological and psychological factors which militate for the craft organisation of non-manual workers are likely to weaken and the likelihood will grow that the new technological trends will favour industrial trade unions rather than craft unions.

The Problem of Spreading Wage Increases

The last consideration concerns the relationship between workers in various industries. In addition to the (vertical) wage pyramid within an industry, there has always been a trend towards horizontal wage differentiations by industries. Apart from historical factors, of which the wage differentials between agricultural and industrial labour offer the most striking example, and apart from different degrees of trade union organisation in various industries, differences in wage levels between industries seem to be traceable to two further factors : the market situation of particular industries and the degree of their productivity.

In industries which at a given period are " in the shade " the wage levels obviously tend to be lower than in industries which are in the bright sunlight of a boom. Similarly, in industries in which technological progress is less marked the wage level will tend to rise more slowly than in industries in which technological progress is rapid.

Trade unions are a counteracting factor in this process of wage differentiation. Were it not for the unions, horizontal differentials might be much more pronounced than they are.

It seems, however, that the trade unions cannot entirely curb horizontal wage differentials, all the less so as the individual trade unions themselves are mostly confined to one or few industries and as the role of the national trade union federations in the field of wage policies is mostly confined to general guiding lines.

Quite obviously, the trend towards horizontal wage differentiation will be strengthened by automation, mainly because the application of automated methods will, at least for the immediate future, be confined to a rather restricted number of industries.

Horizontal wage differentials by industries are obviously highly undesirable from the point of view of general trade union principles. Various means could be devised to avoid a strengthening of this trend as a result of the concentration of automated processes in a few industries. First of all, workers in non-automated industries would receive a share in the benefits resulting from automation if, in addition to a certain spreading of wage increases, prices of products of automated industries were reduced as various trade union statements on automation have urged. Furthermore, workers in non-automated industries should benefit through the introduction of minimum wage legislation or through increases in statutory minimum wages. But the most important factor will be the determination of the trade unions themselves to continue their struggle for wage increases in all industries, including those not directly affected by automation.

It can be assumed that a systematic policy of wage-spreading may imply a change in the relationship of the national trade union federation to the individual unions. The national federations may have to acquire more authority in determining wage policies for their affiliated organisations than they have at present in most countries. In other words, the centralising tendencies may grow in the trade union movement.

Another factor which might contribute to the growth of centralising tendencies within the trade union movement seems to be the likelihood of jurisdictional problems. Technological changes are frequently accompanied by problems of this kind and it would not be very surprising if technological changes on so large a scale as they are occurring in our present era had similar effects on the demarcation lines between various trade unions. It is obviously easier to solve such problems where the authority of the national trade union centre is strong enough to mediate effectively between contending unions or to assist in fusion agreements between them where conditions for a solution of jurisdictional problems through fusion would be favourable.

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To derive from the spectacular changes in technology that characterise our age concrete conclusions in the social and cultural fields, and on trade union policies and trends in particular, an unusual number of predictions have had to be made in this article. It is needless to emphasise that all of these predictions are highly

tentative. It may nevertheless appear well warranted to draw such tentative conclusions in view of the importance of a thorough discussion of the problems involved. What conclusions history itself will draw from the technological changes of our time will depend on many factors, such as the speed with which these changes are introduced ; the sum total of benefits which result from them ; the strength of the partners at the collective bargaining tables ; the political influence which trade unions and political groups in sympathy with their views can wield in the governments and parliaments that will have to decide about social policy, social security, financial policies, and educational problems ; and the conclusions which the trade unions themselves will draw for their own wage and other policies, as well as for their own organisational structure. But one thing which will contribute to the outcome of the interplay of all these factors will be the public discussion of the social, economic and cultural problems involved in the technological changes. This discussion can be engaged upon only if those who conduct it are ready to make predictions and to formulate tentative conclusions.

REPORTS AND INQUIRIES

Wages and Related Elements of Labour Cost in European Industry, 1955

A Preliminary Report

The inquiry on which the present study is based was undertaken as a result of the work of the first European Regional Conference of the I.L.O. (Geneva, 1955) [1], *which discussed at some length the subject of international differences in wages and labour costs and recommended the making of international comparisons. A committee of statistical experts was convened by the International Labour Office in May 1955 to aid the Office in planning an inquiry on the subject. The experts agreed on basic definitions of wages and related elements of labour cost, considered model questionnaires prepared by the I.L.O., suggested a number of industries to be covered, and recommended that the inquiry should be based principally on statistics of establishments.*

Invitations to participate in the inquiry were issued to all European States Members of the I.L.O. in late 1955, and Austria, Belgium, Denmark, France, the Federal Republic of Germany, Greece, Italy, Turkey, the United Kingdom, and Yugoslavia agreed to participate. The statistical offices of these countries distributed questionnaires to establishments during 1956, and data were made available to the I.L.O. late in 1956 and during the first half of 1957. Information on the coal and steel industries of four member countries was provided by the High Authority of the European Coal and Steel Community.

The information presented in the following preliminary report is limited to wage earners, except in state railways where the data apply to wage earners and salaried employees. Eight industries are represented. Data are provided showing basic wages paid for time worked, premium pay for overtime, late shifts, etc., bonuses and gratuities, payments in kind, hours paid for but not worked, obligatory and non-obligatory social security contributions, direct benefits, subsidies, and a miscellaneous group of "other" items which in some countries are considered to be elements of labour cost.

The final report of the inquiry will contain information relating to salaried employees in all industries and will present detailed statistics for sub-groups of the major cost categories presented in this article. Aggregative statistics based on national accounts and the operating accounts of social security agencies will also be presented.

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[1] See *International Labour Review*, Vol. LXXI, No. 4, Apr. 1955, pp. 325-346.

INTRODUCTION

Supplements to wages, viewed either as elements of workers' income or as elements of employers' costs, have received increasing attention in recent years. It has become apparent that statistics of wages alone no longer provide a complete measure of either income or cost, and that both wages and supplements to wages must be taken into account. Employers now generally recognise that the payments which they record under the heading of wages in their accounts are an inadequate measure of labour cost. The increasing prevalence of vacations with pay, family allowances, social insurance, and other social programmes is largely responsible for this recognition, but advances in the fields of wage statistics and industrial cost accounting and a rising level of economic consciousness have also played a part. Interest in wages and related elements of labour cost first arose on a national level, but the growing importance of regional economic co-operation and the potentialities of a European common market have stimulated interest in international comparisons of labour costs.

Objectives of the Inquiry

The significance of country-to-country labour cost differentials in international trade is a much debated subject. Many business and political leaders regard such differences as formidable obstacles to economic co-operation. Economists, however, generally take a different view. A group of economists which recently reported on the social aspects of European economic co-operation at the invitation of the Governing Body of the I.L.O. stated that " . . . it is clear that in a fairly balanced international economy considerable international differences in the general level of wages and social charges will exist. Such differences, even when they are much greater than those prevailing in Europe, can scarcely create lasting difficulties for the high-wage countries when their economies are considered as a whole." [1]

The I.L.O.'s inquiry was not carried out with the purpose of evaluating obstacles to economic co-operation. There is fairly general agreement, however, that a careful assembly of the facts about labour cost would help to clarify the discussion of economic co-operation and perhaps reveal that certain problems have been exaggerated. From the point of view of individual producers or industries, moreover, the problems raised by country-to-country differences in labour cost are widely acknowledged. There has been considerable demand for labour cost data for purposes quite unrelated to economic co-operation. The major objectives of the study may therefore be stated as follows:

(1) to provide an objective statistical measure of country-to-country differences in labour costs per hour in selected industries in Europe;

(2) to provide employers in the selected industries with information, in the form of industry averages, on the amount and nature of labour costs in their own countries;

(3) to indicate the nature of the major social programmes established for the benefit of workers, particularly those programmes financed wholly or in part by means of employers' contributions;

[1] I.L.O.: *Social Aspects of European Economic Co-operation. Report by a Group of Experts*, Studies and Reports, New Series, No. 46 (Geneva, 1956), p. 39.

(4) to indicate the relative importance of employers, workers and governments in the financing of social programmes benefiting workers [1]; and

(5) incidentally, to throw light on certain elements of workers' income other than the normal wage, particularly in so far as such elements are financed by employers.

What the Study Does Not Do

Because the temptation may arise to draw conclusions from these data which are not fully warranted, it appears desirable to warn the reader of the limitations of this study.

Cost per Hour and Unit Cost.

In the first place, in the absence of sufficient information on workers' output, the study is restricted to measuring the cost of labour *per hour*. Although output per hour in any given industry probably varies less from country to country in Europe than among countries in different regions of the world, it is clear that differences in labour cost per hour may well be offset by differences in productivity.

Labour Cost and Workers' Income.

It is important to emphasise, moreover, that the study is concerned with labour cost to the employer, and does not measure differences in workers' income. Some costs, such as wages proper, are also important elements of this income; others, such as employers' social security contributions, may result only in deferred or contingent income to workers. On the other hand, an appreciable part of workers' income in some countries may consist of social services which are financed largely by the State and do not enter into employers' costs.

Labour Cost and Workers' Benefits.

Finally, some elements of labour cost do not necessarily correspond to workers' benefits at all. Overtime or holiday work at premium rates is not invariably regarded as desirable by the workers. Medical examinations associated with recruitment may simply provide a screening device designed to safeguard the employer from job candidates of doubtful health. In the following pages several of the costs which appear to involve little or no benefit for the worker have been dealt with separately as " other payments related to labour cost " because they have not been treated uniformly by the participating countries.

Earlier Work in the Field

Research in the field of labour cost is not new. Preliminary inquiries relating to a number of elements of cost (principally family allowances, social insurance, and holidays with pay) were made by the I.L.O. as far back as the 1930s.[2] In the post-war period limited computations were presented to the Seventh International Conference of Labour

[1] This objective was served by another part of the inquiry, not covered by the present article but to be dealt with in a final report. This second part, based on national accounts and the reports of social agencies, covered the entire economy of each participating country.

[2] See " Wages, Hours of Work, and Other Factors in the Remuneration of Workers in Certain Towns in October 1932. II ", in *International Labour Review*, Vol. XXVIII, No. 1, July 1933.

Statisticians [1] and in the report on social aspects of European economic co-operation already cited.

National statistical offices and employers' organisations have made a number of studies relating to single countries in recent years. Limited data are compiled monthly in Italy and more comprehensive surveys are made at two-year intervals in France. Studies have also been made by public or private agencies in Austria, Finland, the Netherlands, Norway, Sweden, and the United States, among other countries. On an international basis, comparisons for the coal and steel industries of member countries have been published annually in recent years by the High Authority of the European Coal and Steel Community.[2] More comprehensive studies, covering a greater number of countries, have been made in France.[3]

Method of Study

The general plan of inquiry, adopted after consultation with the committee of statistical experts in May 1955, was executed in each participating country by an officially designated statistical agency, which adapted the standard rules and procedures to national use. The responsible agency in each country was either the central statistical organisation of the country or a research or statistical service in the Ministry of labour or of social affairs.

Considerable effort was made to assure comparability in the results obtained. A standard list of industries was established, model questionnaires and instructions drafted and certain standard methods of procedure recommended. In general, participating countries were able to adhere quite closely to the standard questionnaire drafted by the I.L.O. Several countries were able to translate the questionnaires into their national language without change. Some made minor changes to take particular national institutions or conditions into account or to eliminate detail that was known to be unavailable. In a few cases more substantial adaptations were required, e.g. in Yugoslavia, where the socialist organisation of the economy necessitated certain modifications. In the case of the High Authority of the European Coal and Steel Community, the data were rearranged by the I.L.O. so as to be comparable with the materials supplied directly by national statistical services on the basis of the I.L.O. model questionnaire. In cases where it was necessary to make estimates, these are indicated in the footnotes to the appropriate tables.

Data Requested

It was not considered desirable, in view of existing differences in accounting practice, to establish a rigid definition of labour cost. Information was therefore requested for a standard group of items that were believed to account for most labour costs, and employers were permitted considerable free choice in reporting any additional items that they regarded as elements of labour cost. This technique was designed to yield comparability throughout most of the range of costs to be examined

[1] I.L.O. : *Wages and Payroll Statistics*, Studies and Reports, New Series, No. 16 (Geneva, 1949).

[2] See High Authority of the European Coal and Steel Community : *Les salaires et les charges sociales dans les industries de la Communauté* (Luxembourg, 1955).

[3] See " Les salaires et les charges sociales dans les pays de l'O.E.C.E. ", in *Etudes et conjoncture* (Paris), Mar. 1954.

and at the same time to allow for differences in the definition of labour cost. In fact, as will be indicated below, employers in most countries reported only small expenditures outside the comparable standard cost categories. The individual categories covered will be discussed below in connection with tables III to X.

Consideration was given to including questions on the wage differential based on sex; employers who pay the same rates to male and female workers sometimes argue that this puts them at a competitive disadvantage as compared with employers who pay women less than men for performing similar work. This item was not included, however, since differentials based on sex are already reflected in the wage data presented in the study and since a considerable amount of information on wages by sex of worker is already available in official statistics.

Establishments Represented

It was not deemed feasible to cover all European industry, and it was decided to limit the study to eight industries. The industries covered, while not equally important in the economies of the different countries, cover a broad range of activities. Six are manufacturing industries (cotton textiles, leather footwear, radio-electronics, machine tools, shipbuilding, steel), one is extractive (coal mines), and one is a transport industry (state railways).

National statistical agencies undertook to obtain information from a representative group of establishments within each industry. Some countries sent questionnaires to all establishments of a given size, but most sent them only to samples of establishments. The returns from establishments in France and the Federal Republic of Germany were weighted so as to reflect the industry structure as a whole. Some 8,000 establishments contributed data, ranging from more than 4,000 in the Federal Republic of Germany to fewer than 100 in Greece and Yugoslavia.

European countries usually endeavour to include in their wage statistics all establishments with ten or more wage earners, and occasionally extend the coverage to even smaller establishments. In the present study, however, France covered establishments with 11 or more workers, Belgium, the Federal Republic of Germany, and Turkey those with 20 or more, while the " cut-off " point was 25 in the United Kingdom, 30 in Greece, and 50 in Italy. In the case of railways the data usually refer to a single national railway system, and the same is true of coal mining in the United Kingdom, where a single agency—the National Coal Board—operates the country's mines. Even when few establishments were covered, however, a large proportion of employment in the industry concerned was included.

It can be assumed that the over-representation of larger establishments in the present study may result in some upward bias in the indicated level of wages and related elements of labour cost, but it is doubtful whether the distortion is seriously disturbing for present purposes. A rough test of the reasonableness of the establishment reports was made by comparing average hourly earnings as reported in the present study and the averages published in the official wage statistics of the different countries. Despite some differences in the definitions of the industries and certain other sources of non-comparability, the results of this rough test were reassuring. In 18 comparisons made in three industries the average earnings indicated by the present

study were lower in eight cases and higher in ten than the official averages ; only four cases showed a difference of more than 10 per cent.

Review and Tabulation by the I.L.O.

The summaries of data from establishments were examined by the I.L.O. in order to detect and correct any improperly classified items and, in general, to assure as high a degree of comparability as possible in the data for different countries. Relatively few changes were necessary, however. The percentage relationship of the individual elements of labour cost to the sum of comparable cost items were computed from aggregates, without converting the basic data to an hourly basis.

The aggregate cost of hours paid for but not worked was computed as the product of the number of hours paid for but not worked and the average basic wage per hour, excluding premiums and bonuses.[1] In a few instances (notably in the steel industry of countries members of the European Coal and Steel Community and in the data reported by Belgium and the United Kingdom) it was not possible to separate premium pay from the basic wage and in these cases the cost of hours paid for but not worked is slightly overestimated.

Information on subsidies and on a miscellaneous group of " other " items was reported for wage earners and salaried employees combined. The totals reported were allocated to wage earners and salaried employees separately on the basis of the relative numbers of such persons employed in reporting establishments.

In the following pages most of the data are presented as *percentages*, with individual elements of cost expressed as a percentage of the sum of comparable cost items. In view of the wide interest attaching to country-to-country comparisons in comparable *money* terms, however, the data have also been converted (in table XIII) to Swiss francs at Swiss clearing or agreed payment rates. While conversion by means of exchange rates could not be justified in comparisons of labour *income*, there is some justification for this approach in *cost* comparisons. Swiss francs were chosen as a convenient hard currency traded in all European countries, but the data in national currencies presented as items 13 to 15 of tables III to X permit conversion to other currencies if desired.

Relative Importance of Labour Costs Other than Wages in Various Countries

Industrial wage statistics are collected regularly by most European countries and are the subject of frequent comparison. Information regarding other elements of labour cost is much less frequently assembled and no standard methods for analysing such information are as yet generally recognised.

Basis for Comparing Labour Costs Other than Wages

The relative importance of items of labour cost other than wages can be shown by expressing such items as a percentage of the sum of

[1] A uniform procedure was followed with respect to the data for all countries, although several countries had obtained reports from employers on hours paid for but not worked. The differences between the reported and computed figures were not great and, since they were matched by off-setting differences in the basic wage, did not affect the total of wages and selected elements of labour cost.

wages and related elements of labour cost or as a percentage of wages alone. The former approach has been adopted in the present report.

If the comparisons were made with wages alone, " average hourly earnings " might be used as the starting point. This approach has the advantage of referring to the wage in the form in which it is probably best known. Each element of labour cost may be expressed as a percentage of average hourly earnings, even though some elements that it may be desirable to treat as " related costs ", such as wage premiums and bonuses, form part of the base. As a practical matter, however, this approach does not produce a non-wage total that can be added to the wage without duplication. The treatment of hours paid for but not worked, moreover, presents great difficulties.

Alternatively, the " basic wage ", excluding wage premiums and bonuses, might be used. There is much to be said for this approach since the basic wage is often the primary subject dealt with by the wage contract. Pay for hours not worked can be separated from pay for hours worked and the former added to wage supplements to yield a meaningful total, since time not worked is generally not remunerated at premium rates. In practice, however, payroll accounts in some European countries do not provide sufficient detail to make the computation of the " basic wage " possible.

In the interest of international comparability, therefore, the present study presents labour costs as percentages of the sum of wages and comparable non-wage cost items (the sum of the elements shown as items 3 to 10 of tables III to X). Certain costs, minor in most instances, which are not strictly comparable from country to country have been excluded from the total that serves as base and appear as item 12 of tables III to X ; they are believed to be legitimate labour costs, but they have not been reported uniformly by the various countries ; moreover, they are not commonly associated with social programmes. Nevertheless the detail presented in tables III to X is sufficient to permit recalculation of the percentages on the basis of the total of all reported labour costs, and certain supplementary tabulations based on these larger totals appear in the following pages.

Country-to-Country Differences

Great interest attaches to national differences in the elements of labour cost, and it is this aspect of the material at hand that will first be considered. Summary data by country and by industry are presented in table I, which shows the sum of the non-wage elements of labour cost as a percentage of all comparable elements of labour cost.

Before commenting on the significance of table I and the following tables, it is important to indicate clearly what costs have been taken into account. The labour costs here used included all of the groups of items reported in the present study which are comparable from country to country and exclude the category " other payments related to labour cost ", the content of which was not fixed in the I.L.O. model questionnaire but was left to the choice of the participants. They comprise the basic wage for time worked, wage premiums, bonuses, payments in kind, pay for vacations, public holidays, and other time paid for but not worked, obligatory and non-obligatory social security contributions, direct benefits, and subsidies. The non-wage items are sometimes termed " social charges ", " wage supplements " or " fringe benefits " but, as has been explained above, do not necessarily imply the existence of

TABLE I. SELECTED NON-WAGE ELEMENTS OF LABOUR COST [1] EXPRESSED AS PERCENTAGES OF TOTAL COMPARABLE ELEMENTS OF LABOUR COST, 1955

(All industries : wage earners)

Country	Cotton textiles	Leather footwear	Radio-electronics	Machine tools	Ship-building	Steel industry	Coal mining	State railways [2]
	A. All non-wage elements							
Austria	33.1	28.7	33.7	35.7	28.4	40.5	42.1	61.0
France	31.1	27.2	32.1	31.9	33.9	—[3]	—[3]	51.3
Germany (F.R.)	24.6	23.6	30.0	28.3	26.4	—[3]	41.2	—
Greece	31.8	—	—	29.8	—	—	35.5	32.8
Italy	43.7	42.8	43.9	41.7	44.5	—[3]	49.8	—
Turkey	35.0	—	—	43.4	41.5	—	40.6	—
Yugoslavia	49.1	49.9	—	51.9	52.5	43.5	51.2	53.6
	B. Non-wage elements other than premiums for overtime, etc.							
Austria	30.5	27.8	33.0	33.4	27.4	34.8	38.2	60.3
Belgium	21.0	20.5	21.2	22.1	24.6	23.7	27.4	49.6
France	29.8	26.4	28.3	28.1	29.4	33.4	41.4	49.0
Germany (F.R.)	23.1	23.0	28.7	26.5	23.8	31.2	39.8	—
Greece	31.4	—	—	27.5	—	—	26.5	26.0
Italy	43.4	42.5	43.0	40.6	42.0	39.7	49.0	—
Turkey	34.3	—	—	23.1	29.5	—	39.7	—
United Kingdom	12.6	12.2	—	10.3	8.9	9.5	16.4	11.2
Yugoslavia	48.2	48.9	—	49.7	48.1	37.2	47.5	48.1

[1] Non-wage elements of labour cost comprise premium pay for overtime, late shift, and holiday work, bonuses and gratuities, payments in kind, hours paid for but not worked, obligatory and non-obligatory social security contributions, direct benefits, and subsidies. For definitions see footnote 2, p. 568. [2] Includes salaried employees. [3] Premium pay not separable from basic wage.

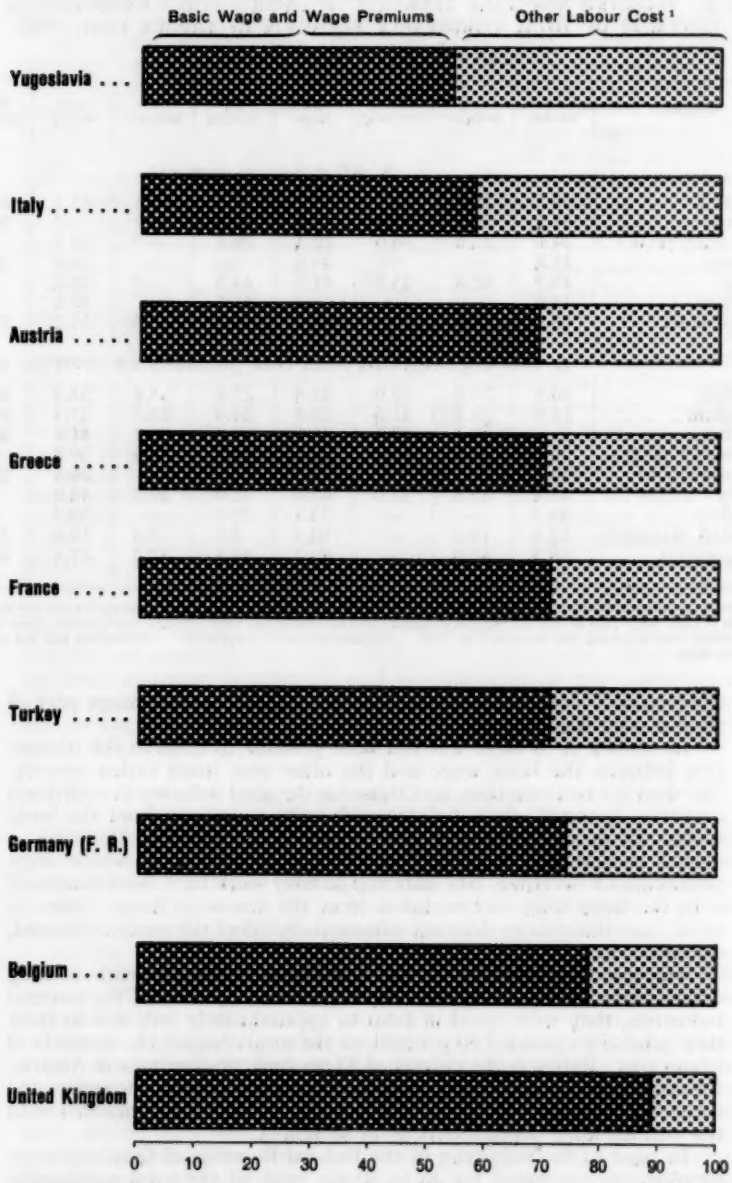
comparable " workers' benefits ". They include a very large part of all non-wage labour costs.

In section A of table I it has been possible to observe the distinction between the basic wage and the other cost items rather strictly. The data for two countries, and those for the steel industry in additional countries, however, do not distinguish wage premiums from the basic wage. In order to afford a more complete comparison, therefore, a second presentation is made in section B of table I, in which wage premiums for overtime, late shift and holiday work have been combined with the basic wage and excluded from the non-wage items. Since in most cases this change does not substantially affect the results obtained, attention may be directed primarily to section B.

The great significance of the various wage supplements is fully demonstrated by these figures. In Yugoslavia, in most of the covered industries, they were equal in total to approximately half and in Italy they generally exceeded 40 per cent. of the total comparable elements of labour cost. Ratios in the vicinity of 30 per cent. predominate in Austria, France, Greece and Turkey. With regard to Turkey, however, the ratios are substantially higher when wage premiums are included with the various wage supplements as in section A.

In most of the industries in the Federal Republic of Germany wage supplements accounted for 20 to 30 per cent. of the total comparable elements of labour cost and the ratios for most Belgian industries also fell in this range, though at a somewhat lower level. Wage supplements

CHART 1. WAGES AS PERCENTAGE OF TOTAL LABOUR COST [1] PER HOUR WORKED, SELECTED MANUFACTURING INDUSTRIES, 1955



[1] Excludes " other payments ", minor in most countries, which are shown as item 12 of tables III to VIII.

accounted for the smallest proportion of the total comparable elements of labour cost in the United Kingdom, where except for coal mining (16.4 per cent.) the ratios ranged from 8.9 to 12.6 per cent.

Viewed in another way it may be seen that the Yugoslav establishments paid roughly as much in the form of wage supplements (" social charges ") as in the form of a basic wage. Such supplements amounted to three-fourths of the basic wage in Italy and at least half as much in several other countries.

The preceding discussion has not treated the subject of inter-industry differences in non-wage labour costs, which will be dealt with in the following section. It will have been noted from table I, however, that the ratios in the six manufacturing industries show considerable consistency within each country. This fact suggests the appropriateness of an average of the ratios for manufacturing industries as a simplified means of judging inter-country differences. Averages of this type (based on section B of table I) are shown in chart 1 and table II, in which the ratios for the various manufacturing industries have been combined into a simple arithmetic average.

Before concluding this discussion it is necessary to refer to certain " other payments related to labour cost " which, because they are not comparable in content from country to country, were excluded from table I. In general, the importance of this item is small, since few costs outside the standard groups are recorded as labour costs. If certain sources of incomparability of the item are disregarded and it is included in the country-to-country comparison, the effect is relatively minor except in France, where a 5 per cent. tax based on payrolls, replacing the *impôt cédulaire*, is generally regarded as a labour cost and has been

TABLE II. RELATIVE IMPORTANCE OF NON-WAGE ELEMENTS IN TOTAL LABOUR COST IN MANUFACTURING INDUSTRIES, 1955

(Unweighted average of percentages for covered manufacturing industries) [1]

Country	Comparable non-wage elements of labour cost (excluding wage premiums) as percentage of total comparable elements of labour cost [2]	All reported non-wage elements of labour cost (excluding wage premiums) as percentage of total reported labour cost [3]
Yugoslavia	46	47
Italy	42	42
Austria	31	32
Greece	30	30
France	29	32
Turkey	29	30
Germany (F.R.)	26	27
Belgium	22	22
United Kingdom	11	11

[1] Covered manufacturing industries comprise the cotton textile, leather footwear, radio-electronic, machine tool, shipbuilding, and steel industries. For industries not covered in individual countries see tables III to VIII. [2] Comparable non-wage elements of labour cost comprise bonuses and gratuities, payments in kind, hours paid for but not worked, obligatory and non-obligatory social security contributions, direct benefits, and subsidies. The other items in " total comparable elements of labour cost " include the basic wage for time worked plus premium pay for overtime, late shift, and holiday work (see table I B). [3] The elements taken into account in computing these percentages are the same as those considered in the preceding column except that certain " other payments related to labour cost " have been included both in the numerator and in the denominator.

so reported.[1] A recalculation of the non-wage cost, *including the item "other payments related to labour cost"*, as a percentage of the total reported cost items yields the average percentages shown in the final column of table II. Although the figures for most of the other countries are little changed, the figure for France clearly reflects the influence of the special tax.

Non-Wage Labour Costs in Individual Industries

Information on labour costs by country and by class of item is shown for each of the eight covered industries in tables III to X.[2]

[1] Payment of this 5 per cent. tax was shifted to French employers in September 1948 in the course of wage negotiations, when it was arranged to eliminate the progressive tax ranging from 0 to 16 per cent. assessed against workers' wages as part of a general income tax *(impôt cédulaire)*. This tax shift was considered to be in lieu of a wage increase. The proceeds of the tax are contributed to the general revenues of the State.

[2] The content of the different categories of costs is indicated below. The item numbers correspond with those appearing in the tables.

1. *Sum of wages and selected costs.* The total of all reported labour costs other than the non-comparable items reported under item 12.

2. *Basic wage for time worked.* The basic wage comprises payments in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings; it excludes premium pay for overtime, late shift, and holiday work, bonuses and gratuities, and the value of payments in kind. The basic wage includes such components of pay as cost-of-living allowances. The wage for time worked, as a portion of the total wage, has been estimated from figures on the number of hours worked and the number of hours paid for but not worked.

3. *Premium pay for overtime, late shift and holiday work.* The addition to basic pay given to workers as a premium for overtime work, late shifts, and holidays. It does not include the basic pay for such work, i.e. if a worker receives time-and-one-quarter for overtime hours it is only the "one-quarter" which constitutes the premium.

4. *Bonuses and gratuities.* Payments such as Christmas, year-end, or profit-sharing bonuses paid to the workers, other than as a function of work performed.

5. *Payments in kind.* The cost to employers of that portion of remuneration provided to the worker in the form of goods and services either gratis or at a price below cost.

6. *Hours paid for but not worked.* Annual vacation, public holidays, and other hours for which pay is received but no work is performed.

7. *Obligatory social security contributions.* Contributions which the employer is required by law to make to agencies providing for the contingencies of old age, disability, death (survivors' benefits), sickness, maternity, unemployment, employment injury, dependants (family allowance), and, in some countries, other social programmes.

8. *Non-obligatory social security contributions.* Contributions analogous to those referred to under item 7, which the employer makes by virtue of individual decision, industry agreement among employers, collective agreement, or common custom.

9. *Direct benefits.* Sums paid by the employer to the worker or his beneficiaries, or to a reserve fund for payment to the worker or his beneficiaries, in case of birth, marriage, death, dependency (family allowances or supplements to family allowances), termination of employment (severance pay), employment injury, and, in some countries, certain other contingencies.

10. *Subsidies.* Net payments by the employer (excluding capital expenditure but including depreciation) to facilities providing workers or their families with medical and health care, canteens, restaurants, and other food services, building funds, company housing, other housing, credit unions and other financial aid services, crèches, vacation homes, other family services, educational, cultural, and recreational services, and, in some countries, certain other facilities.

11. *Sum of items 3 to 10.*

12. *Other payments related to labour cost.* The cost of recruitment, vocational training, recruitment examinations and on-the-job medical and health services, plus other costs considered as labour cost by the establishments or country in question.

13. *Average hourly earnings.* The sum of basic wages (for time worked and time not worked) plus wage premiums and bonuses, divided by the number of hours paid for. This is the form in which hourly wages are most frequently computed by European countries.

14. *Basic wage per hour.* The basic wage for time worked (item 2) divided by the number of hours worked.

15. *Basic wage plus selected elements of labour cost per hour worked.* The sum of items 2 to 10 divided by the number of hours worked.

Certain characteristics of the industries affect the level of wages and the nature of the non-wage costs. The following paragraphs comment briefly on each industry.

Cotton textiles (table III). This part of the study was intended to cover cotton spinning and weaving and most countries limited their studies to these aspects of production. Coverage in the United Kingdom, however, is described as " cotton spinning, doubling and weaving ", that in Austria as " cotton spinning " and that in the Federal Republic of Germany as the textile industry in general. It is a low-wage, competitive industry the products of which are much involved in international trade. It employs many women workers.

The non-wage elements of labour cost as a percentage of the sum of all comparable labour costs in this industry conform relatively closely to the pattern for manufacturing industry shown in table II. Contributions for various social programmes showed little tendency to exceed those of other manufacturing industries, despite the industry's relatively low wage levels. Production was not booming in 1955 and little overtime was worked.

Leather footwear (table IV). This industry, like cotton textiles, is competitive, employs many female workers, and generally pays rather low wages. It has many small establishments, though these are probably under-represented in the data at hand.

The non-wage cost items tended to be relatively less important in leather footwear than in other covered manufacturing industries.

Radio-electronic products (table V). This industry was added to the standard list somewhat later than the others and material was obtained in only five countries. The industry was defined somewhat differently in the various countries, depending in large part on the variety and volume of electrical equipment produced. It is identified as radio-electronics in the Belgian study, as radio-television in Italy, low-current appliances in Austria and electrical machinery in the Federal Republic of Germany. It should be mentioned that the Belgian data are considered tentative and that certain reservations as to their significance have been expressed by the national statistical service in view of the small number of establishments covered.

The radio-electronic and related industries employ large numbers of semi-skilled workers, including women and girls, but also require highly skilled workers. Average hourly earnings are consequently somewhat higher than in the manufacture of textiles and footwear. The percentage importance of non-wage cost items, however, did not differ markedly from the pattern for other manufacturing industries. Premium payments for overtime were small.

Machine tools (table VI). This industry was defined as " machinery " in the Federal Republic of Germany and Yugoslavia and as " machine works " in Greece. These terms suggest somewhat broader limits than were observed in the remaining countries.

This is a heavy industry as compared with those discussed above. It requires many skilled workers, employs few women and girls, and pays relatively high wages. There is keen international competition.

The machine tool industry was quite active in 1955 and premiums for overtime, late shift and holiday work were appreciable. Bonuses also were more substantial than in most covered industries. The per-

centage importance of non-wage cost items, however, was not far from the average for manufacturing industries.

Shipbuilding (table VII). Shipbuilding is a predominantly large-scale industry, depends principally on a male labour force, and pays relatively high wages. Like most of the other industries covered, it involves lively international competition. It is characterised by relatively wide variations in the intensity of work, and it is not surprising to find sizable payments for premiums and bonuses reported by some countries, particularly France, Italy, Turkey and Yugoslavia. The percentage importance of non-wage cost items is not far out of line with the averages for the six manufacturing industries covered.

Steel (table VIII). Data presented for members of the European Coal and Steel Community were obtained by the High Authority, which defines the industry in the terms of the Treaty establishing the Community. The data supplied by Austria, the United Kingdom and Yugoslavia apply to blast furnaces, steel works and rolling mills. In view of differences in the questionnaires employed by the High Authority and the I.L.O. the data representing members of the Coal and Steel Community do not permit detailed comparisons with the data for non-members, despite certain adjustments made by the I.L.O., but the comparability of the figures for the broad categories presented in table VIII is believed to be reasonably good.

As a heavy industry depending on a male labour force, steel pays high wages. Premium pay and bonus payments, although reported separately for only two countries, appear to have been appreciable in 1955.

Wage supplements in the steel industry tend to be slightly higher than in other covered manufacturing industries. In France and the Federal Republic of Germany non-wage costs formed a higher percentage of the sum of all comparable cost items than in other manufacturing industries covered. In Yugoslavia, however, steel ranked lowest in this respect.

Coal mines (table IX). The mining industry has special characteristics of considerable importance from the point of view of labour cost. The work is hard and dangerous. Recruitment has often been difficult, and has prompted the payment of high wages, the development of liberal social benefits, special provisions for housing, etc.

It should be noted that certain differences exist between the data obtained from the European Coal and Steel Community (which exclude lignite mines) and those obtained directly from non-member countries. For the most part, however, these differences affect the classification of costs in different categories but do not affect the totals.

Wage premiums and bonuses were very prevalent in coal mining in 1955, accounting for 18 per cent. of the sum of comparable cost items in Greece, 8 per cent. in Yugoslavia and Austria, and substantial amounts in several other countries. Non-wage costs comprised a consistently higher percentage of the sum of all comparable cost items than in the manufacturing industries studied, Greece constituting the only exception. There were a number of striking differences in the pattern of labour costs as compared with that in manufacturing industries. Wages in kind were generally very important, amounting in France to 12 per cent. of the total cost measured and in Germany to 10 per cent. Social security contributions were also substantially larger in coal mines

TABLE III WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Cotton textile industry : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium	France	Germany (F.R.)	Greece	Italy	Turkey	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [2]	66.9	79.1	68.9	75.4	68.2	56.3	65.0	87.4	50.9
3. Premium pay for overtime, late shift and holiday work	2.6		1.3	1.5	0.5	0.3	0.7		1.0
4. Bonuses and gratuities	0.8	0.1	0.8	2.2	8.5	5.8	3.1	0.6 [3]	5.8
5. Payments in kind	1.0	0.1	0.1	— [4]	0.3	0.6	7.5	0.3	0.8
6. Hours paid for but not worked	9.4	6.3	4.5	6.5	5.0	7.1	10.4	5.9	6.1
7. Obligatory social security contributions	15.3	13.8	21.0	9.5	14.7	27.1 [5]	7.1	3.3	26.7
8. Non-obligatory social security contributions	0.4	— [4]	0.9	2.8	0.8	— [4]	0.0	0.6	0.0
9. Direct benefits	2.1	0.1	0.1	0.5	1.4	1.9	5.1	0.4	— [4]
10. Subsidies [6]	1.6	0.6	2.4	1.7	0.7	1.0	1.1	1.6	8.8
11. Sum of items 3-10	33.1	— [7]	31.1	24.6	31.8	43.7	35.0	— [7]	49.1
12. Other payments related to labour cost	0.6	0.1	4.3	0.5	0.8	— [4]	0.4	0.5	0.3
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Drachmas**	**Liras**	**Pounds**	**Shillings**	**Dinars**
13. Average hourly earnings [8]	6.23	19.88	142.62	1.41	5.69	161.28	0.79	3.26	47.94
14. Basic wage per hour	5.97	— [7]	138.61	1.35	5.06	147.12	0.75	— [7]	42.86
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	8.92	25.10	201.12	1.79	7.42	261.46	1.15	3.71	84.24

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [3] Includes an unspecified amount of " other wage payments ". [4] Less than 0.05 per cent. [5] Includes contributions to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [6] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [7] Not available. [8] The sum of basic wages (for hours actually worked and for hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated.

TABLE IV. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Leather footwear industry : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium	France	Germany (F.R.)	Italy	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [2]	71.3	79.6	72.8	76.4	57.2	87.8	50.1
3. Premium pay for overtime, late shift, and holiday work	0.9		0.8	0.6	0.3		1.0
4. Bonuses and gratuities	1.3	0.1	0.2	1.3	6.2	0.9 [3]	8.9
5. Payments in kind	0.1	— [4]	— [4]	— [4]	0.4	0.0	0.1
6. Hours paid for but not worked	8.1	6.4	4.0	7.3	6.8	5.9	5.5
7. Obligatory social security contributions	14.9	13.8	21.0	9.7	27.4 [5]	3.0	26.4
8. Non-obligatory social security contributions	0.2	0.1	0.1	3.2	— [4]	1.5	0.0
9. Direct benefits	1.8	— [4]	— [4]	0.4	1.5	0.4	— [4]
10. Subsidies [6]	1.5	0.1	1.2	1.0	0.3	0.5	8.1
11. Sum of items 3-10	28.7	— [7]	27.2	23.6	42.8	— [7]	49.9
12. Other payments related to labour cost	0.1	— [4]	4.2	0.4	— [4]	0.1	0.2
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Liras**	**Shillings**	**Dinars**
13. Average hourly earnings [8]	7.19	18.95	142.93	1.41	147.15	3.44	54.17
14. Basic wage per hour	7.00	— [7]	141.06	1.38	133.64	— [7]	46.02
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	9.81	23.79	193.92	1.81	233.67	3.88	91.86

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [3] Includes an unspecified amount of " other wage payments ". [4] Less than 0.05 per cent. [5] Includes contributions to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [6] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [7] Not available. [8] The sum of basic wages (for hours actually worked and for hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated.

TABLE V. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Radio-electronic industry : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium	France	Germany (F.R.)	Italy
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [2]	66.3	78.8	68.0	70.0	56.1
3. Premium pay for overtime, late shift and holiday work	0.7		3.8	1.4	0.9
4. Bonuses and gratuities	6.1	0.3	2.0	2.2	6.0
5. Payments in kind	0.2	— [3]	0.1	— [3]	3.6
6. Hours paid for but not worked	7.6	6.3	5.3	6.3	6.6
7. Obligatory social security contributions	14.7	12.8	18.7	9.7	24.4 [4]
8. Non-obligatory social security contributions	1.1	0.1	— [3]	6.5	— [3]
9. Direct benefits	1.6	0.7	0.2	0.9	1.4
10. Subsidies [5]	1.7	0.9	2.0	3.1	0.8
11. Sum of items 3-10	33.7	— [6]	32.1	30.0	43.9
12. Other payments related to labour cost	2.5	1.2	4.3	1.6	0.4
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Liras**
13. Average hourly earnings [7]	7.32	26.70	194.57	1.63	210.35
14. Basic wage per hour	6.70	— [6]	180.38	1.56	189.28
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	10.11	33.74	265.48	2.23	337.35

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [3] Less than 0.5 per cent. [4] Includes payments to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [5] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [6] Not available. [7] The sum of basic wages (for hours actually worked and for hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated.

TABLE VI. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Machine tool industry : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium	France	Germany (F.R.)	Greece	Italy	Turkey	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [2]	64.3	77.9	68.1	71.7	70.2	58.3	56.6	89.7	48.1
3. Premium pay for overtime, late shift and holiday work	2.3		3.8	1.9	2.4	1.0	20.3		2.3
4. Bonuses and gratuities	2.3	1.0	1.4	2.4	7.7	5.6	4.0	0.2 [3]	4.4
5. Payments in kind	0.2	0.1	0.1	— [4]	— [4]	0.6	4.7	0.1	0.5
6. Hours paid for but not worked	10.2	6.2	5.1	6.2	2.9	6.2	7.4	6.3	6.2
7. Obligatory social security contributions	14.4	14.1	19.3	9.7	15.7	26.1 [5]	4.5	2.3	29.2
8. Non-obligatory social security contributions	0.6	— [4]	0.1	5.0	0.1	0.1	0.0	0.4	0.0
9. Direct benefits	3.7	0.5	0.1	0.9	0.8	1.1	2.4	0.1	— [4]
10. Subsidies [6]	2.1	0.2	2.0	2.2	0.1	1.1	0.2	0.8	9.4
11. Sum of items 3-10	35.7	— [7]	31.9	28.3	29.8	41.7	43.4	— [7]	51.9
12. Other payments related to labour cost	2.7	0.2	4.5	1.3	0.1	0.1	0.8	0.9	1.2
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Drachmas**	**Liras**	**Pounds**	**Shillings**	**Dinars**
13. Average hourly earnings [8]	8.63	27.60	211.33	1.76	6.27	212.52	1.09	4.54	58.06
14. Basic wage per hour	8.13	— [7]	197.27	1.67	5.51	192.84	0.79	— [7]	51.67
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	12.63	35.03	289.55	2.33	7.85	330.55	1.40	5.04	107.45

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [3] Includes an unspecified amount of " other wage payments ". [4] Less than 0.05 per cent. [5] Includes contributions to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [6] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [7] Not available. [8] The sum of basic wages (for hours actually worked and for hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated.

TABLE VII. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Shipbuilding industry : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium	France	Germany (F.R.)	Italy	Turkey	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.00
2. Basic wage for time worked [2]	71.6	75.4	66.1	73.6	55.5	58.5	91.1	47.5
3. Premium pay for overtime, late shift, and holiday work	1.0		4.5	2.6	2.5	11.9		4.4
4. Bonuses and gratuities	— [3]	0.6	1.2	1.3	5.5	5.4	0.1 [4]	6.5
5. Payments in kind	0.0	— [3]	— [3]	— [3]	1.2	5.2	— [3]	0.6
6. Hours paid for but not worked	14.6	6.0	4.4	7.0	7.1	7.8	5.2	5.9
7. Obligatory social security contributions	9.8	17.3	21.5	10.8	24.2 [5]	5.6	2.5	27.8
8. Non-obligatory social security contributions	0.2	0.3	0.4	2.7	0.1	0.0	0.5	0.0
9. Direct benefits	1.4	0.2	— [3]	0.4	1.2	5.5	0.2	— [3]
10. Subsidies [6]	1.4	0.2	1.8	1.6	2.8	0.1	0.4	7.4
11. Sum of items 3-10	28.4	— [7]	33.9	26.4	44.5	41.5	— [7]	52.5
12. Other payments related to labour cost	2.1	0.2	4.9	1.4	0.2	1.2	0.4	0.5
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Liras**	**Pounds**	**Shillings**	**Dinars**
13. Average hourly earnings [8]	8.56	30.10	181.05	1.85	223.61	1.26	4.88	64.21
14. Basic wage per hour	8.46	— [7]	167.57	1.76	198.29	1.00	— [7]	53.39
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	11.81	39.67	253.52	2.39	357.48	1.71	5.35	112.35

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [3] Less than 0.05 per cent. [4] Includes an unspecified amount of " other wage payments ". [5] Includes contributions to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [6] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [7] Not available. [8] The sum of basic wages (for hours actually worked and for hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated.

TABLE VIII. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Steel Industry : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium	France	Germany (F.R.)	Italy	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [2]	59.5	76.3	66.6	68.8	60.3	90.5	56.5
3. Premium pay for overtime, late shift, and holiday work	5.7						6.3
4. Bonuses and gratuities	5.7	1.4	1.4	3.9	4.9	— [3]	2.4
5. Payments in kind	2.9	0.7	6.1	1.6	1.3	0.3	0.7
6. Hours paid for but not worked	5.7	6.9	4.0	5.1	5.4	5.2	5.8
7. Obligatory social security contributions	14.6	13.4	19.4	9.5	23.2 [4]	2.3	17.9
8. Non-obligatory social security contributions	0.6	0.4	0.6	7.0	0.3	0.9	0.0
9. Direct benefits	3.1	1.1	1.9	4.1	4.5	0.2	0.1
10. Subsidies	2.2 [5]					0.9 [5]	10.3 [5]
11. Sum of items 3-10	40.5	— [6]	— [6]	— [6]	— [6]	— [6]	43.5
12. Other payments related to labour cost	0.9	0.3	5.2	2.4	0.5	1.0	0.9
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Liras**	**Shillings**	**Dinars**
13. Average hourly earnings [7]	9.5 [4]	34.36 [8]	189.99 [8]	2.48 [8]	283.53 [8]	4.86	56.85
14. Basic wage per hour	8.11	— [6]	— [6]	— [6]	— [6]	— [6]	49.83
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	13.63	44.30	279.92	3.42	437.25	5.37	88.23

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [3] Less than 0.05 per cent. [4] Includes contributions to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [5] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [6] Not available. [7] The sum of basic wages (for hours actually worked and hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated. [8] Computed as described in note 7 above, except that total man-hours remunerated were estimated by the I.L.O. on the basis of man-hours actually worked, and " direct wages " for time worked and other time paid for, as reported by the High Authority of the European Coal and Steel Community.

TABLE IX. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(Coal mining : wage earners)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria [1]	Belgium [2]	France	Germany (F.R.)	Greece	Italy	Turkey	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [3]	57.9	71.7	58.6	58.8	64.5	50.3	59.4	83.6	48.8
3. Premium pay for overtime, late shift, and holiday work	4.0	1.0	— [4]	1.4	9.0	0.7	0.9		3.8
4. Bonuses and gratuities	3.9	0.0	0.0	1.4	9.0	4.1	4.4	0.0	4.6
5. Payments in kind	6.2	4.4	11.8	10.4	0.2	6.7	8.3	4.6	2.2
6. Hours paid for but not worked	6.9	5.4	5.4	6.2	5.4	6.0	9.3	5.3	5.4
7. Obligatory social security contributions	17.4	16.8	23.4	20.2	10.2	26.5 [5]	12.7	2.0	26.8
8. Non-obligatory social security contributions	0.1	0.1	0.0	0.2 [6]	0.0	0.3	0.0	2.6	0.0
9. Direct benefits	2.7	0.7	0.7	1.4	1.4	5.4	2.3	0.5	— [7]
10. Subsidies	1.0 [8]				0.4 [8]		2.7 [8]	1.5 [8]	8.5 [8]
11. Sum of items 3-10	42.1	28.4	— [4]	41.2	35.5	49.8	40.6	— [4]	51.2
12. Other payments related to labour cost	0.6	1.7	5.1	1.0	0.6	0.9	0.7	1.0	0.7
Hourly wages in units of national currency	**Schillings**	**Francs**	**Francs**	**Marks**	**Drachmas**	**Liras**	**Pounds**	**Shillings**	**Dinars**
13. Average hourly earnings [9]	8.97	31.20 [10]	215.96 [10 11]	2.26 [10]	7.21	203.26 [10]	0.95	5.82	62.80
14. Basic wage per hour	8.00	30.81	— [4]	2.16	5.73	187.20	0.88	— [4]	54.41
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	13.82	43.00	368.41 [11]	3.67	8.88	372.55	1.48	6.96	111.57

[1] Data for certain establishments which failed to provide separate figures for wage earners were estimated by the I.L.O. on the basis of the figures for wage earners and salaried employees in the larger number of establishments which provided such data. [2] A special one-time wage payment amounting to 1.6 per cent. of the basic wage, made in January 1955, is not taken into account in the calculations. It is reported by the High Authority of the European Coal and Steel Community that this payment was compensated by a reduction in employers' contributions to workers' vacation pay. [3] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [4] Not available. [5] Includes contributions to the housing fund (INA CASA) and wage equalisation fund (Cassa Integrazione Guadagni). [6] Excludes non-obligatory family allowances, which are included in the figure given under item 7. [7] Less than 0.05 per cent. [8] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [9] The sum of basic wages (for hours actually worked and hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated. [10] Computed as described in note 9 above, except that total man-hours remunerated were estimated by the I.L.O. on the basis of data relating to shifts worked and other shifts paid for, as reported by the High Authority of the European Coal and Steel Community. [11] Excludes premium pay for overtime, late shift, and holiday work.

TABLE X. WAGES AND RELATED ELEMENTS OF LABOUR COST, 1955

(State railways : wage earners and salaried employees)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria	Belgium	Denmark	France	Greece *	United Kingdom	Yugoslavia
1. Sum of wages and selected costs (items 2-10) . .	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2. Basic wage for time worked [1]	39.0	50.4	77.1	48.7	67.2	88.8	46.4
3. Premium pay for overtime, late shift, and holiday work	0.8			2.3	6.1		5.5
4. Bonuses and gratuities	0.1	0.0		0.1	6.1	0.0	6.4
5. Payments in kind	0.5	0.1	1.9	0.1	1.4	— [2]	3.4
6. Hours paid for but not worked	7.5	7.3	12.4	8.1	5.6	6.3	3.8
7. Obligatory social security contributions	3.2	40.9	2.7	38.1	11.9	2.6	26.2
8. Non-obligatory social security contributions . .	0.0	1.3	0.0	0.0	0.0	0.0	0.0
9. Direct benefits	47.9 [3]	— [4]	5.9	2.5	1.2	2.0	— [4]
10. Subsidies [5]	1.1	— [4]	— [4]		0.5	0.3 [6]	8.3
11. Sum of items 3-10	61.0	— [4]	— [2]	51.3	32.8	— [2]	53.6
12. Other payments related to labour cost	0.2	0.3	0.3	5.3	0.2	— [2]	0.6
Hourly wages in units of national currency	**Schillings**	**Francs**	**Crowns**	**Francs**	**Drachmas**	**Shillings**	**Dinars**
13. Average hourly earnings [7]	8.80	32.38	4.62	204.06	9.18	4.50	60.62
14. Basic wage per hour	8.64	— [2]	— [2]	195.74	7.85	— [2]	49.01
15. Basic wage plus selected elements of labour cost (items 2-10) per hour worked	22.17	64.25	5.99	401.78	11.69	5.07	105.65

* *Note.* The figures for Greece are provisional. Final figures will appear in the final report on the inquiry.

[1] Comprises payments (for hours actually worked) in the form of time rates of pay of time-rated workers, incentive pay of time-rated workers, and piece earnings. [2] Not available. [3] Principally pensions to former railway officials and their survivors. [4] Less than 0.05 per cent. [5] Includes the wages of certain persons employed in subsidised facilities whose wages are also included in the basic wage. [6] Estimated value of welfare, training, education, and medical services, exclusive of both capital and maintenance costs. [7] The sum of basic wages (for hours actually worked and hours paid for but not worked), premium pay for overtime, late shift, and holiday work, and bonuses and gratuities, divided by total man-hours remunerated.

(though the distinction between obligatory and non-obligatory contributions is not always clear in the figures provided). Subsidies do not appear to be generally high, despite the importance of the housing programmes operated by some mining concerns, except in Yugoslavia and Italy.

Hours paid for but not worked, for members of the Coal and Steel Community, were estimated from shifts paid for but not worked and average hours per shift.

State railways (table X). The data for railways are somewhat different from those relating to other industries, since the railways are state-operated and the staffs are in many ways assimilated to civil servants, with a special wage structure and special social benefits. In addition, since no distinction is made between wage earners and salaried employees, the data relate to all workers with established positions (excluding supernumerary or non-civil-service personnel). It will be noted that the seven countries represented include Denmark.

Average hourly earnings are higher than in some of the other industries, partly because supervisory and executive staff are included in the averages.

Wage supplements constitute a very important cost item for railways. Generous civil service pension schemes and liberal vacation policies offer part of the explanation. Another important factor is that consolidations, mechanisation and similar changes have resulted in substantial reductions in railway staffs; a number of European railways make payments to a large body of retired railwaymen and their dependants or survivors, while currently employing a smaller staff. The railways in both Belgium and France made substantial payments in 1955 to cover previous deficits of social funds or to provide supplementary benefits for retired workers whose original pensions had become inadequate because of post-war inflation. It is reported that the Austrian railway system pays pensions to a number of persons who were once employed by the Austro-Hungarian railway system in what is now Hungary, but who are domiciled in Austria.

* * *

Owing to the considerable variation of the percentages from country to country, it seems inadvisable to compute an average percentage for each industry, showing the relationship of non-wage costs to the sum of all comparable cost items. It is clear, however, that non-wage costs are relatively more important in some industries than in others. The rough method of rank ordering provides a means of distinguishing the industries in which non-wage costs are most important from those in which they are least. This method has been employed in table XI, which is based on the percentage importance of wage supplements (as shown in tables III to X).

It will be seen from the rank order given in this table that non-wage costs were relatively most important in the two non-manufacturing industries, state railways and coal mining; as a rule these industries alternated in first and second place. Among manufacturing industries the differences were not great, but wage supplements were quite generally least important in the cotton textile and leather footwear industries.

TABLE XI. RELATIVE IMPORTANCE OF NON-WAGE COSTS, BY INDUSTRY, 1955 [1]

(Specified industries : wage earners)

Industry (ranked from highest to lowest in percentage importance of non-wage costs) [2]	Non-wage costs as percentage of total comparable elements of labour cost	
	Highest country percentage	Lowest country percentage
1. State railways [3]	61.0	32.2
2. Coal mines	51.2	35.5
3. Shipbuilding	52.5	26.4
4.-5. Radio-electronics [4]	43.9	30.0
4.-5. Machine tools [4]	51.9	28.3
6. Steel industry [5]	43.5	31.2
7. Cotton textiles	49.1	24.6
8. Leather footwear	49.9	23.6

[1] For definition of non-wage costs see table I. Data for Belgium and the United Kingdom are not included in this table since premium pay could not be separated from the basic wage. [2] Average of individual country rankings. [3] Includes salaried employees. [4] The radio-electronics and machine tools industries have the same rank order. [5] In computing percentages for the steel industry in France, the Federal Republic of Germany and Italy wage premiums have been combined with basic wages.

Individual Categories of Labour Cost

In order to simplify the discussion the various non-wage elements of labour cost have been considered largely as a composite of cost groups in earlier sections, although it has been recognised that the relative importance of the individual classes of costs vary substantially from country to country and from industry to industry. The following paragraphs comment briefly on each category of labour cost other than the basic wage for time worked. Most of these categories in turn, to be sure, are composites of more detailed data reported by the participating countries. The full detail will be presented in the final report on this inquiry.

Wage Premiums

It is appropriate to deal with premium pay and bonuses first, not because of their quantitative importance but because they form part of average hourly earnings and in this respect are distinguished from the other items.

As has been explained, wage premiums include only the additional "premium" payment, over and above the basic wage, for overtime work or work on late shifts or holidays. Although practice is not entirely uniform, premiums are commonly paid for such work in all the participating countries. Variations in premium pay consequently tend to depend on the nature of the industry and on economic conditions affecting it. In 1955 wage premiums were most common in the heavy industries, but seldom exceeded 5 per cent. of the sum of comparable cost items.

Table XII shows rough data for each country in the form of simple arithmetic averages of the percentages for covered manufacturing industries. The relatively high figure shown for Turkey reflects the influence of high premium payments in the machine-tool industry and shipbuilding.

Bonuses and Gratuities

These payments may also reflect the level of economic activity but are influenced more by industry and national practice. Greece, Italy, Turkey and Yugoslavia paid liberal bonuses in most covered industries, some of these amounting to 10 per cent. or more of the sum of all comparable cost items. In other countries substantial bonus payments were confined largely to the steel and coal-mining industries.

Obligatory Social Security Contributions

By and large, as shown in table XII, obligatory social security contributions were the most important single non-wage element of labour cost. Among participating countries the only exceptions to this generalisation were Turkey, where social security is not yet far advanced and wage supplements assumed other forms, and the United Kingdom, where the extensive system of social security is financed largely out of taxation. Referring to the data on manufacturing industry presented in table XII, it will be seen that obligatory contributions alone averaged about 20 per cent. of the sum of comparable labour cost items in France, 25 per cent. in Italy and 26 per cent. in Yugoslavia. The contributions paid in coal mining and the state railways were generally larger than in manufacturing, although special circumstances influenced the figures for railways in Austria.

TABLE XII. SPECIFIED ELEMENTS OF LABOUR COST EXPRESSED AS PERCENTAGE OF THE SUM OF COMPARABLE COST ITEMS IN COVERED MANUFACTURING INDUSTRIES, WAGE EARNERS, 1955 [1]

(Unweighted average of industry percentages)

Elements of labour cost expressed as percentage of the sum of comparable cost items (items 2-10)	Austria	Belgium	France	Germany (F.R.)	Greece [2]	Italy	Turkey [2]	United Kingdom [2]	Yugoslavia [2]
3. Premium pay for overtime, late shift, and holiday work	2.2	— [3]	2.8 [4]	1.6 [4]	1.4	1.0 [4]	11.0	— [3]	3.0
4. Bonuses and gratuities	2.7	0.6	1.2	2.2	8.1	5.7	4.2	0.4 [5]	5.6
5. Payments in kind	0.7	0.1	1.1	0.3	0.2	1.3	5.8	0.1	0.5
6. Hours paid for but not worked	9.3	6.4	4.6	6.4	4.0	6.5	8.5	5.7	5.9
7. Obligatory social security contributions	13.9	14.2	20.1	9.8	15.2	25.4	5.7	2.7	25.6
8. Non-obligatory social security contributions	0.5	0.1	0.4	4.5	0.4	0.1	0.0	0.8	0.0
9. Direct benefits	2.3	0.4 [6]	0.4 [6]	1.2 [6]	1.1	2.0 [6]	4.3	0.2	— [7]
10. Subsidies	1.7	0.3 [6]	1.6 [6]	1.6 [6]	0.4	1.0 [6]	0.4	0.8	8.8

[1] Comparable cost items include basic wage plus non-wage costs listed in footnote 1 of table I. [2] Averages based on fewer than six industries. For industries covered, see table I. [3] Not available. [4] Average excludes the steel industry, for which data were not available. [5] Including an unspecified amount of " other wage payments ". [6] Subsidies and direct benefits were reported as a combined figure for the steel industries of these countries by the High Authority of the European Coal and Steel Community, and were classified as direct benefits in computing this table, which slightly affects the averages for these countries. [7] Less than 0.05 per cent.

Non-Obligatory Social Security Contributions

Non-obligatory contributions were very small except in the Federal Republic of Germany, where this item averaged 4.5 per cent. in manufacturing and supplemented to an important extent the relatively small obligatory contributions paid at that time. Appreciable payments in the state-owned coal mines of the United Kingdom and the state railways of Belgium were designated as " non-obligatory ".

Hours Paid for but Not Worked

This item ranked second in importance (in manufacturing industries) in seven countries and first in one (the United Kingdom). The estimated payments for holidays, vacations and similar periods were relatively greatest in Turkey and Austria (both about 9 per cent. of the sum of comparable cost items in manufacturing) and in Belgium, the Federal Republic of Germany and Italy (about 6.5 per cent.). They were least important in Greece (4 per cent.) and France (4.6 per cent.).

Payments in Kind

These payments were common in all covered industries in Turkey, ranging from 4 to 8 per cent. of the sum of comparable cost items. Otherwise payments in kind were important only in coal mining, and in the steel industry of a few countries. The grant of an allowance of coal to miners is common practice in Europe. Total payments in kind, principally coal, were valued at 10 per cent. of comparable costs in the Federal Republic of Germany, 12 per cent. in France and 6 per cent. in Austria. Payments in kind in the French steel industry were valued at 6 per cent.

Direct Benefits and Subsidies

These items were minor in most countries. Yugoslavia, however, granted subsidies equivalent to 9 per cent. of the sum of comparable cost items. Turkish, Italian and Danish employers gave important direct benefits in particular industries. In the Austrian state railways, as a result of special circumstances already mentioned, direct benefit exceeded total wages.

Other Payments Related to Labour Cost

The 5 per cent. tax on wages in France has been described earlier. It was reported in all covered industries. Otherwise, costs reported in this category were not important, generally ranging from 1 to 2 per cent. of the sum of comparable cost items. Since the industries concerned were primarily radio-electronics, machine tools, shipbuilding and steel, it may be surmised that appreciable costs for recruitment and training were involved. The data available under this heading are not shown in table XII because they are not comparable from country to country.

Direct Comparison of Wages and Related Elements of Labour Cost

The data discussed in earlier sections have been presented in the form of relatives, with the various elements of labour cost expressed only as percentages of the total of wages and other comparable cost

items. This approach facilitates comparisons from country to country but it has certain drawbacks. In the first place it is apparent that a high percentage of wage supplements may result from low wages as well as from liberal contributions to social programmes and related items. But, more important, a comparison of relative figures fails to answer the persistent question : what are the comparative levels of labour costs?

In the interest of affording a comparison in absolute terms, table XIII presents the average hourly earnings, the basic wage per hour and the sum of wages and other comparable labour costs per hour worked for each industry and each participating country in terms of Swiss francs. Data for six industries are presented graphically in chart 2. The same wage data are given in national currency units under items 13, 14 and 15 of tables III to X. Those interested will find it possible, therefore, to convert the data to other currency units or to compare them by other means. The percentages given in tables III to X also make it possible to state individual elements of labour cost in national currency units and in a common currency.

Table XIII provides a convenient basis for contrasting conventional measures of hourly wages with a more comprehensive measure of labour cost per hour worked. The chief interest in this table, however, lies in direct comparison of labour costs per hour worked from country to country within the covered industries. For this purpose the figures should be interpreted with particular caution. First, any bias in the data that may result from over-representation of the larger establishments, from difference in industry limits, etc., is of greater significance in absolute comparisons than in the comparisons of relatives presented earlier. Second, conversion to a common currency by means of exchange rates, although more appropriate in comparisons of costs than in comparisons of incomes, yields at best only rough comparability. Third, it should not be forgotten that the comparisons relate only to cost per hour and not to cost per unit of product. Fourth, it is important to note that the data represent costs and are unsuitable for comparisons of worker income.

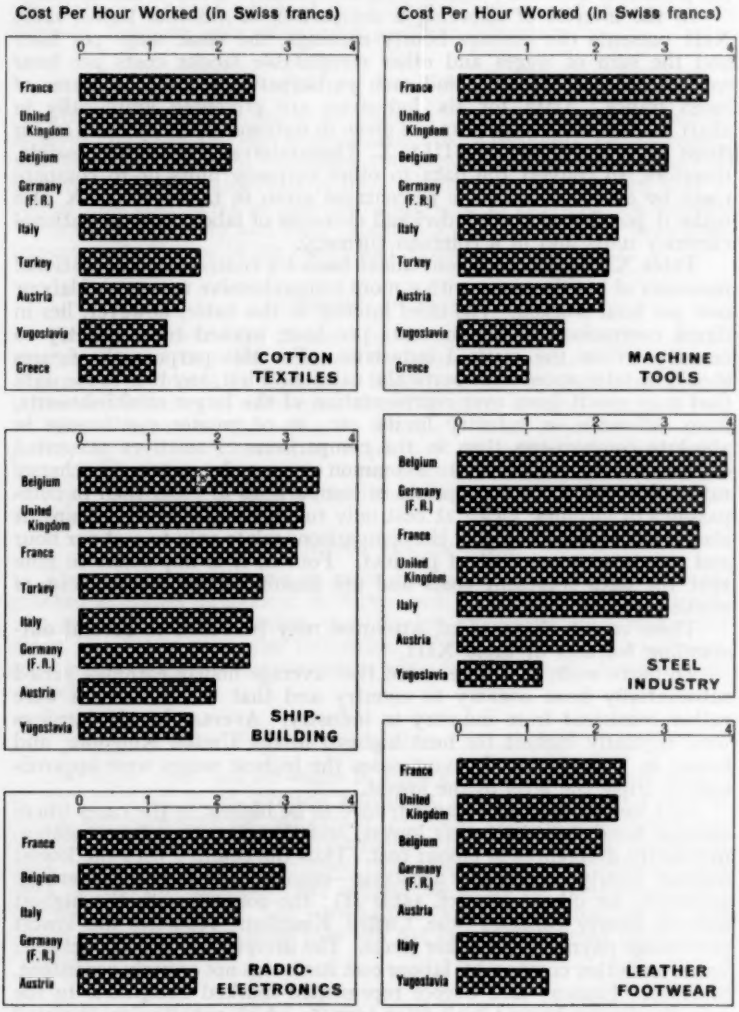
These *caveats* disposed of, attention may be called to several outstanding features of table XIII.

To begin with, it will be noted that average hourly earnings varied substantially from country to country and that the differences were rather consistent from industry to industry. Average hourly earnings were regularly highest (or next highest) in the United Kingdom, and lowest in Yugoslavia. In most cases the highest wages were approximately triple the level of the lowest.

Cost items other than wages tended to be highest in the cases where average hourly earnings were lowest, and therefore to reduce country-to-country differences in labour cost. Thus the country with the lowest average hourly earnings—Yugoslavia—reported the largest percentage payments for other costs (cf. table II) ; the country with the highest average hourly earnings—the United Kingdom—reported the lowest percentage payments for other items. The inverse relationship between wages and other comparable labour cost items was not entirely consistent, however. France [1] and Greece represented marked exceptions to the rule, the former being a high wage country which nevertheless reported

[1] The exchange rates used in this comparison were those in effect in 1955, the year represented by the study. The recent adjustment in the rates of the French franc has tended to lower French labour costs as measured in other currencies.

CHART 2. LABOUR COST [1] PER HOUR WORKED IN SELECTED MANUFACTURING INDUSTRIES, 1955



[1] Figures from table XIII.

TABLE XIII. WAGES AND OTHER COMPARABLE ELEMENTS OF LABOUR COST, 1955, EXPRESSED IN SWISS FRANCS [1]

(All industries : wage earners)

Country	Cotton textiles	Leather footwear	Radio-electronics	Machine tools	Ship-building	Steel industry	Coal mining	Railways [2]
Austria :								
Average hourly earnings.	1.05	1.21	1.23	1.45	1.44	1.60	1.51	1.48
Basic wage per hour . .	1.00	1.18	1.13	1.37	1.42	1.36	1.35	1.45
Cost per hour worked [3] .	1.50	1.65	1.70	2.12	1.99	2.29	2.32	3.73
Belgium :								
Average hourly earnings.	1.74	1.66	2.34	2.42	2.63	3.01	2.73	2.83
Basic wage per hour . .	—	—	—	—	—	—	—	—
Cost per hour worked [3] .	2.20	2.08	2.95	3.07	3.47	3.88	3.76	5.62
France :								
Average hourly earnings.	1.78	1.79	2.43	2.64	2.26	2.37	2.70	2.55
Basic wage per hour . .	1.73	1.76	2.25	2.47	2.09	2.33	2.70	2.45
Cost per hour worked [3] [4]	2.51	2.42	3.32	3.62	3.17	3.50	4.61	5.02
Germany (F.R.) :								
Average hourly earnings.	1.47	1.47	1.70	1.83	1.93	2.58	2.35	—
Basic wage per hour . .	1.41	1.44	1.62	1.74	1.83	2.45	2.25	—
Cost per hour worked [3] .	1.86	1.88	2.32	2.43	2.49	3.56	3.82	—
Greece :								
Average hourly earnings.	0.83	—	—	0.92	—	—	1.05	1.34
Basic wage per hour . .	0.74	—	—	0.81	—	—	0.84	1.15
Cost per hour worked [3] .	1.09	—	—	1.15	—	—	1.30	1.71
Italy :								
Average hourly earnings.	1.13	1.03	1.47	1.49	1.57	1.98	1.42	—
Basic wage per hour . .	1.03	0.94	1.32	1.35	1.39	1.85	1.31	—
Cost per hour worked [3] .	1.83	1.64	2.36	2.31	2.50	3.06	2.61	—
Turkey :								
Average hourly earnings.	1.23	—	—	1.70	1.97	—	1.48	—
Basic wage per hour . .	1.17	—	—	1.23	1.56	—	1.37	—
Cost per hour worked [3] .	1.79	—	—	2.18	2.67	—	2.31	—
United Kingdom :								
Average hourly earnings.	2.00	2.11	—	2.78	2.99	2.97	3.56	2.75
Basic wage per hour . .	—	—	—	—	—	—	—	—
Cost per hour worked [3] .	2.27	2.37	—	3.08	3.27	3.29	4.26	3.10
Yugoslavia :								
Average hourly earnings.	0.70	0.79	—	0.85	0.94	0.83	0.92	0.89
Basic wage per hour . .	0.63	0.67	—	0.75	0.78	0.73	0.79	0.72
Cost per hour worked [3] .	1.23	1.34	—	1.57	1.64	1.29	1.63	1.54

[1] Exchange rates used for conversion into Swiss francs were clearing rates for Austria, Greece, Turkey and Yugoslavia and agreed rates for Belgium, France, Germany, Italy and the United Kingdom. Source : *Annuaire statistique de la Suisse 1955* (Berne, 1956). [2] Includes salaried employees. [3] Cost comprises wages and other comparable elements of labour cost as shown under item 15 of tables III to X. [4] Cost per hour worked, including the 5 per cent. employer payment replacing the former *impôt cédulaire*, was as follows : cotton textiles, 2.61 ; leather footwear, 2.52 ; radio-electronics, 3.45 ; machine tools, 3.76 ; shipbuilding, 3.29 ; steel industry, 3.62 ; coal mining, 4.75 ; railways, 5.22.

relatively high non-wage costs, the latter being a relatively low-wage country with moderate non-wage costs.

Despite these exceptions, average differences in labour cost from country to country were less marked than average differences in hourly earnings. In the cotton textile industry, for example, the average deviation from the mean of hourly earnings was 29 per cent., but the average deviation from the mean of labour costs was only 20 per cent. In the machine tool industry the average deviation dropped from 31 per cent. to 24 per cent.

Finally, the ranking of the various countries with respect to labour cost per hour is appreciably different from their ranking in terms of average hourly earnings alone, the changes affecting the upper and lower ends of the scale. The following relative rankings from highest to lowest are based on unweighted averages of covered manufacturing industries alone.

Ranked according to average hourly earnings	*Ranked according to labour cost per hour worked*
1. United Kingdom	1. France
2. Belgium [1]	2. Belgium
3. France [1]	3. United Kingdom
4. Germany (F.R.)	4. Germany (F.R.)
5. Turkey	5. Italy
6. Italy	6. Turkey
7. Austria	7. Austria
8. Greece [1]	8. Yugoslavia
9. Yugoslavia [1]	9. Greece

Conclusions

The disclosure that non-wage expenditures, consisting largely of contributions to social programmes and the cost of various other worker benefits, make up an important part of total labour cost will come as no surprise to European employers, who have become acutely aware of the growth of " social charges " during the post-war period. The data now available from establishment records, however, permit employers to compare their circumstances with those prevailing in other countries and in different types of industries. They provide information in considerable detail for use by workers, consumers and public administrators, supplementing the conventional wage information available in many countries.

In view of the magnitude of the non-wage items and their variance by country and by industry, it is clear that such items can no longer be ignored in comparisons of labour cost.

Many observers see in such cost differences an argument for increased " harmonisation " of social programmes and of methods of financing such programmes. There is considerable agreement among economists, however, that differences in the general level of labour cost among countries need not constitute a serious problem in international trade for the high-wage countries. Even where such differences are not offset by differences in other costs or in productivity, cost differences between economies can be modified through exchange rate adjustments.

[1] France and Belgium had approximately the same rank order, as did Greece and Yugoslavia.

The position of the individual producer is quite another matter. A significant difference in costs as compared with his competitors, either domestic or foreign, may determine the size of his profits or his ability to stay in business. His workers are also concerned with the cost question, which may profoundly influence employment opportunities in the sector in which they gain their livelihood. The consumer can learn from an analysis of labour costs to what extent certain gains in the well-being of employees affect the cost of doing business and the prices of consumer goods. The public administrator may wish to review such information in considering alternative means of financing social security programmes. None of these groups, of course, can afford to neglect the related question of productivity.

So far as non-wage labour costs affect the picture, it is significant to note that country-to-country differences are much more pronounced than inter-industry differences within the same country. With the further development of obligatory social security schemes and the extension of comprehensive collective agreements on conditions of work, it may be expected that the social benefits available to workers in the different countries may show somewhat greater similarity. The extent to which this development will also result in greater similarity of labour costs will depend in part on the system adopted in each country for financing public social programmes.

Shortage of Highly Qualified Engineers and Scientists

The existing shortage of technical and scientific manpower, which threatens to become more acute in the future, has become a matter of major concern in a large number of countries in all stages of economic development. Although most highly industrialised countries are at present enjoying a period of prosperity and full employment, there is a general feeling in them that this situation can be maintained only if they succeed in adapting the supply of scientists and engineers to the ever-increasing demand. The dearth of scientific and technical personnel in industrial countries makes the economic expansion of underdeveloped countries even more difficult to achieve than it would otherwise be. These countries have in the past relied to a large extent on the supply of foreign specialists and, in spite of recent policies for the training of indigenous youth for technical and scientific posts, will continue to need their help for some time to come.

Governments, industry, educational authorities, professional and other organisations are becoming increasingly concerned about this problem, and committees and other bodies have been constituted in order to find possible solutions.[1]

The present article, which is based on a number of recent studies and articles on the question, examines the extent of the problem in various countries and the practical measures required to cope with it. It deals only with scientific and engineering personnel of university or equivalent standard and not with technicians and other supporting staff, the shortage of whom is equally acute.

There appears to be general agreement that the acute shortage of scientists and technical personnel experienced in a large number of countries is not caused by a temporary fluctuation in the demand, but that it is due to the evolution of the social and economic structure and

[1] At the international level, too, the problem of scientific and technical manpower is receiving attention: the Organisation for European Economic Co-operation carried out inquiries in 1954 and 1956 with the aim of ascertaining existing disparities between supply and demand in order to create a basis for remedial action. The Council of the O.E.E.C. has now set up a special working party to facilitate action at the international level and approved the broad lines on which a programme of work should be developed. A conference convened in October 1956 by the European Productivity Agency of the O.E.E.C., attended by scientific leaders from industrial, university and government circles, sought to promote an exchange of ideas and experiences and to bring out suggestions for the solution of manpower problems in applied research. The Agency has also planned to carry out a survey of measures already taken or contemplated by Western European countries, and to study the possibilities for European co-operation in this field. See Organisation for European Economic Co-operation (O.E.E.C.): *Shortages and Surpluses of Highly Qualified Scientists and Engineers in Western Europe* (Paris, Nov. 1955); idem: *The Problem of Scientific and Technical Manpower in Western Europe, Canada and the United States* (Paris, 1957); and European Productivity Agency of the O.E.E.C.: *Scientific Manpower for Applied Research* (Paris, 1956) (Third International Conference on the Organisation and Administration of Applied Research, Vienna, 8-12 Oct. 1956).

the technological development of the countries concerned. The steady advance of pure and applied science, economic expansion, the need for better living standards and for the continuous development of new and cheaper products, as well as a drive for higher productivity, have resulted in a gradual penetration of science and technique into all fields of the economy and in a steady increase in the demand for professional personnel. More engineers are needed to create machinery and new production processes for mechanised and automatic plants; the discovery of nuclear fission as a source of energy has opened entirely new fields of fundamental and applied research; advances in chemistry, in the field of electronics, in the electrotechnical industry, in metallurgy—which has to provide new heat-resisting materials—and in many other fields require large numbers of scientists and engineers. Often entire teams are needed in order to carry out ever more complicated research and to ensure fast development of new products. In recent years a vast development of research activities, facilitated by economic expansion, has accelerated scientific discovery to such an extent that the need for scientists and engineers to carry out fundamental research, apply new knowledge, and ensure the education of youth for these new tasks is increasing much faster than it ever did in the past.

This phenomenon, however, has not been paralleled by an equally large growth in the number of young persons graduating from universities in the fields concerned. Despite the fact that the number of young persons interested in technical and scientific subjects is growing, supply is not keeping up with demand. Many factors have contributed to this situation; for example the lack of interest on the part of students in science and technological subjects, the difficulty of the subject matter, which discourages many students even at secondary-school level, and the somewhat lower prestige attaching to these professions than to traditional fields such as the humanities or the medical and legal professions. This last factor is particularly evident in economically underdeveloped countries, where the excessively high prestige of non-technical occupations has in the past been a major cause of the surplus of arts and law graduates, and the shortage of technical and scientific personnel.

In many instances the capacity of science and technical classes in secondary schools and institutions of higher learning is limited by insufficient space and equipment, and by a serious deficiency of teaching personnel, which has also affected the quality of teaching. Moreover, financial limitations often prevent able students from continuing their education beyond elementary or secondary level.

The Evolution of Supply and Demand

Partial information is available concerning the evolution of the proportion of science and engineering graduates in the labour force.[1] In the Netherlands, for instance, this proportion rose from 0.2 per cent. in 1930 to 0.31 per cent. in 1947. In Norway the percentage doubled between 1940 and 1953. In Switzerland it rose from 0.62 per cent. in 1941 to 0.89 in 1950. In Great Britain there was a moderate increase in the number of scientists and engineers between 1939 and 1946 and a substantial increase thereafter, the 1956 figure being double that for 1939. In Australia there has been a rapid growth in the number of qualified

[1] Data taken mostly from O.E.E.C.: *The Problem of Scientific and Technical Manpower in Western Europe, Canada and the United States*, op. cit.

scientists and technologists during the post-war years. Although accurate statistics are not available, it appears that the number of engineers and chemists has roughly doubled since the end of the last war, while there have been substantial increases in other scientific professions.[1] In Canada the percentage of scientists and engineers in the labour force rose from 0.48 per cent. in 1931 to 0.77 per cent. in 1951. In the United States scientists represented 0.36 per cent. and engineers 1 per cent. of the labour force in 1956, the corresponding percentages for 1940 being 0.17 and 0.5, and in 1950, 0.3 and 0.9.

Information on the number of persons holding engineering and scientific degrees provides only an approximate idea of the actual supply, since a number of these graduates (35 per cent. of trained engineers in the United States [2]) are not employed in the field in which they have been trained. Moreover, in view of differences in various national educational systems, available statistics are not fully comparable. Nevertheless, the figures shown in the accompanying table provide some indication of the relative importance of engineers and scientists in the labour force.

As the table shows the percentages of scientists and engineers in the labour force is largest in the United States and Canada, followed by

NUMBER OF PERSONS HOLDING SCIENCE AND ENGINEERING DEGREES (UNIVERSITY OR EQUIVALENT LEVEL) IN PROPORTION TO TOTAL LABOUR FORCE

Country	Reference period	Total labour force (thousands)	Number of scientists and engineers			Scientists and engineers as percentage of labour force		
			Scientists	Engineers	Total	Scientists	Engineers	Total
Belgium	1947	3,518	4,832	7,905	12,737	0.14	0.22	0.36
	1956	3,555	—	10,000	—	—	0.28	—
Denmark	1956	2,118 [1]	—	7,000	—	—	0.33	—
France	1954	19,182	—	140,000	—	—	0.73	—
Germany (F.R.)	1956	25,389	—	80,000	—	—	0.31	—
Great Britain	1955	23,912	60,000 [2]	81,000	141,000	0.25	0.34	0.59
Italy	1951	19,577	47,200	54,100	101,300	0.24	0.28	0.52
Luxembourg	1955	141	—	380	—	—	0.27	—
Netherlands	1947	3,866	5,328 [3]	6,444 [3]	11,772 [3]	0.14	0.17	0.31
Norway	1955	1,473	3,950	8,900 [4]	12,850	0.26	0.60	0.86
Sweden	1950	3,105	2,200 [5]	9,700	—	—	0.31	—
Switzerland	1950	2,156	—	—	19,200	—	—	0.89
Canada	1951	5,286	12,288	28,776	41,064	0.23	0.54	0.77
	1955 [6]	5,676	25,500	40,000	65,500	0.45	0.70	1.15
United States	1956	70,387	250,000	700,000	950,000	0.36	1.00	1.36

Source: O.E.E.C.: *The Problem of Scientific and Technical Manpower in Western Europe, Canada and the United States*, op. cit.

Note: Dashes indicate that no information is available.

[1] 1953. [2] Pure science (excl. agriculture). [3] Only graduates who have taken a post-graduate examination roughly equivalent to a master's degree. [4] Incl. 900 architects. [5] Agriculture, forestry and veterinary (excl. pure science). [6] Estimates.

[1] Ministry of Labour Advisory Council, Commonwealth of Australia: *The Employment of Scientists and Engineers in Australia* (Melbourne, 1957).

[2] United States Congress, Joint Committee on Atomic Energy: *Hearings . . . on Development, Growth, and State of the Atomic Energy Industry* (Washington, U.S. Government Printing Office, 1956).

Switzerland, Norway and Great Britain, and varies between 0.31 and 1.36 per cent.[1] Moreover, the percentage of engineers is considerably higher than that of scientists. It varies between 0.17 and 1.00 per cent. in the countries covered and is highest in the United States, France, Canada and Norway.

Certain countries have endeavoured to estimate their future personnel requirements for fundamental research, applied science and teaching. The Advisory Council of the Ministry of Labour in Australia states that, while it would be difficult to make numerical estimates of future needs, it is reasonable to conclude that there is scope now and will be in the future for a larger proportion of scientific and technical manpower in the labour force. The most pressing needs are for research workers. Since the end of the war there has also been a particular demand for engineers by state governments and their agencies, which are responsible for most of the major public works and basic services. In Great Britain, following an inquiry, the Ministry of Labour estimated that between 1956 and 1959 the demand of industry and the other main users of scientific and engineering manpower would rise by 26 per cent. (30 per cent. as regards engineers, and 18.5 as regards scientists).[2]

The inquiry also showed that differences exist in the requirements according to fields of specialisation. The largest increase in demand for scientific personnel appears to be in physics, followed by chemistry and geology, whereas the greatest demand for engineering personnel is foreseen in chemical engineering and metallurgy. Generally requirements are highest in expanding industries such as those utilising atomic energy, the chemical industry, the electronics and electrotechnical industries, the metal trades, aviation, etc.

A second study, carried out by the Committee on Scientific Manpower of the Advisory Council on Scientific Policy, concerned likely trends in the long-term demand for scientists and engineers in Great Britain. It was concluded as a result of this study that the required annual output of qualified scientists and engineers would be 16,900 in 1966 and 19,900 in 1970 as compared with the actual output of 10,300 in 1955. Moreover, it was estimated that the increase would be much greater for persons trained in the engineering than in the basic sciences.[3]

According to a study made in France [4] the total deficit of engineers in the labour force will be about 22,000, or 17 to 18 per cent., in 1960, and this deficit will continue to increase at least until 1963, when it is expected that measures currently taken to increase the number of engineers will begin to show results. According to estimates made in the United States the deficit in engineering graduates deriving from the classes 1954 to 1960 will be 60,000 (or 27 per cent.) if present economic expansion continues.[5] It is estimated that an annual output of

[1] In the U.S.S.R. in 1955 engineers and scientists together accounted for a proportion of 1.7 per cent. of the non-agricultural labour force or approximately 0.9 per cent. of the total labour force. There were 586,000 engineers and 223,900 scientific workers.

[2] Ministry of Labour and National Service: *Scientific and Engineering Manpower in Great Britain* (London, H.M. Stationery Office, 1956), p. 9.

[3] *Scientific and Engineering Manpower in Great Britain*, op. cit., pp. 14-15.

[4] VERMONT-GAUCHY: *Nos besoins en ingénieurs* (report published by the Société d'études et de documentation économiques, industrielles et sociales), quoted in *Journal officiel de la République française, Avis et rapports du Conseil économique*, 26 Mar. 1957, p. 358.

[5] United States Congress, Joint Committee on Atomic Energy: *Engineering and Scientific Manpower in the United States, Western Europe and Soviet Russia* (Washington, U.S. Government Printing Office, 1956).

43,000 graduates will be needed in 1964, as against 22,200 in 1954. In Switzerland it has been estimated that in the immediate future the number of engineers graduating each year from universities should be increased by about 50 per cent.[1] Certain contradictory views exist at present in the Federal Republic of Germany concerning future requirements for academic engineers ; whereas some circles wish to see the total capacity of technical universities doubled in the near future in the field of mechanical and electrical engineering, others believe that the present number of engineering students is sufficient and that there is no need for an expansion of university capacity.[2] In Sweden the Committee on Technical Personnel of the Confederation of Swedish Industries estimates that in the ten-year period 1955 to 1965 the required increase in the number of engineers and technicians in industrial and public employment will reach 55 to 65 per cent.[3] The Government of India foresees a shortage of nearly 2,000 graduates deriving from the engineering classes of the academic year 1960-61, the last year of the Second Five-Year Plan.[4]

In the U.S.S.R. the provision of engineers and scientists in numbers commensurate with the targets of over-all state economic planning forms an integral part of the five-year plans for the national economy. The number of specialists graduating from higher educational institutions. (i.e. university level) has risen from 370,000 in the second five-year plan (1933-37) to 652,000 in the fourth (1946-50) and 1,121,000 in the fifth (1951-55). The sixth five-year plan, which began in 1956, provides for a 50 per cent. increase in the total number of specialists graduating with a higher or secondary education in the five-year period and for roughly doubling the number of graduates for heavy industry, construction, transport and agriculture, as compared with the period of the fifth five-year plan.

Practical Measures to Increase the Supply of Engineering and Scientific Personnel

Attracting Larger Numbers of Young Persons to Science and Engineering Faculties of Universities

The inquiry carried out by the O.E.E.C.[5] already referred to showed that, in most of the countries concerned, in the academic year 1954-55 the number of graduates was, as in the past, considerably less in pure and applied science than in other subjects such as arts, law, etc. The percentages of science and engineering graduates in the total number of graduates were : Austria 32 ; Belgium 19 ; Denmark 31 ; France 29 ; Federal Republic of Germany 34 ; Italy 26 ; Luxembourg 48 ; Nether-

[1] P. Soutter : " A propos du manque aigu d'ingénieurs et de techniciens ", in *Bulletin technique de la Suisse romande* (Lausanne), 13 Apr. 1957.

[2] " Die Sorge um den Ingenieur-Nachwuchs ", in *Berufskunde* (Bonn, Bundesministerium für Arbeit), Mar. 1957. See also " Denkschrift über den technischen Nachwuchs ", in *Informationen über das berufliche Bildungswesen* (Düsseldorf, D.G.B.), 15 Aug. 1957.

[3] " Teknikerkommitténs utredning ", in *Industriförbundets Meddelanden* (Stockholm, Sveriges Industriförbund), No. 3, Mar. 1957. See also *Industry and Labour* (Geneva, I.L.O.), Vol. XVII, No. 11, 1 June 1957.

[4] Government of India, Planning Commission : *Report of the Engineering Personnel Committee* (New Delhi, 1957).

[5] O.E.E.C. : *The Problem of Scientific and Technical Manpower in Western Europe, Canada and the United States*, op. cit.

lands 35 ; Norway 39 ; Portugal 42 ; United Kingdom 44 ; Canada 23 ; and the United States 19. In Australia an important increase took place in the post-war period in the proportion of young people graduating from engineering faculties as compared with other faculties. This proportion rose from 6.6 per cent. before the war to 10.8 per cent. in 1955. On the other hand the proportion graduating from science courses, which showed some increase in the immediate post-war years (to 22.4 per cent. in 1948), is now the same as before the war, i.e. 15.3 per cent. The increased proportion of graduates in engineering has been paralleled by smaller proportions graduating in medicine, arts, and law.

Secondary Schools : Suppliers of University Students.

A number of countries recognised that one of the prime conditions for increasing the number of science and engineering students in universities is to stimulate interest in these subjects in secondary schools. Some doubts have been expressed, both in developed and in underdeveloped countries, about the adequacy of the secondary school system in this respect. In France criticisms are directed in particular at the early specialisation either in the humanities or in science required in secondary schools, and two recently introduced Bills on the reform of education [1] propose measures designed to facilitate a better utilisation of scientific talent. In the United States it is felt that not enough science courses are available ; many schools provide none at all.[2] Reports have shown that 24 per cent. of high schools offer no geometry, and 23 per cent. offer neither physics nor chemistry. The figures of a study made in 1954 by the United States Office of Education also reveal that in a large group of high schools the participation of students in the science courses offered is extremely small.[3] Moreover, it is reported that many who attempt university training in these fields are not adequately prepared.

Shortage of Science Teachers.

In the United States the above situation is considered to be largely due to the acute shortage of science teachers, a problem which is closely related to the general lack of scientists and which affects also a large number of other countries. It is felt that the key persons in any efforts to increase the supply of engineers, etc., are the high-school teachers of science and mathematics, especially the inspiring teachers who bring out latent talents. The teacher shortage also affects the quality of teaching : a recent survey indicates that from 250,000 to 400,000 high-school students in the United States are at present learning mathematics and science from teachers not trained to teach these subjects.

It is true that after declining by 60 per cent. between 1950 and 1954 the number of graduates trained to teach science rose again by almost 40 per cent. between 1954 and 1957. However, a large number

[1] " Orientation et formation des ingénieurs et cadres supérieurs des entreprises privées, des entreprises nationalisées, et du secteur public. Rapport présenté au nom du Conseil économique par G. WOLFF ", in *Journal officiel de la République française*, 26 Mar. 1957, op. cit.

[2] *Hearings . . . on Development, Growth, and State of the Atomic Energy Industry*, op. cit.

[3] *The Growing Shortage of Scientists and Engineers, Proceedings of the Sixth Thomas Alva Edison Foundation Institute, November 21-22, 1955* (New York, New York University Press, 1956), p. 41.

do not take teaching positions (42 per cent. in 1952) and many others leave the profession later on.[1] An inquiry has therefore been planned to find out how many teachers leave the profession each year and why they do so and to investigate sources of new teachers, the adequacy of training, etc. One important way of attracting and retaining more teachers, it is felt, would be a substantial increase of their salaries. It has been reported that salaries are in some cases so low as to make it necessary for teachers to take supplementary employment outside school hours.[2] As a result industry, which offers better terms, draws away each year large numbers of potential teachers.

In order to improve the quality of teaching and to make teachers keep pace with recent research progress in science, the National Science Foundation has recently been sponsoring summer courses, which in 1957 were to be attended by 4,500 high-school science teachers, to whom full subsistence, travel and dependants' allowances were to be paid.[3] Some of these courses are organised jointly with the Atomic Energy Commission. For the 1957 programme the Foundation has made a grant of 4.8 million dollars, an amount more than four times larger than that granted in the previous year. In addition to these courses the National Science Foundation will provide in the same year a grant of 4 million dollars to enable 750 high-school science teachers to attend courses for a whole academic year. Each teacher will receive $3,000 plus allowances for dependants and travelling.[4] In addition to these arrangements, other associations are sponsoring similar projects. Moreover, many large industrial undertakings are granting each year hundreds of fellowships for summer courses open to secondary teachers in science.

In Great Britain certain steps have been taken to relieve the shortage of teachers. For the first time in 1956 indefinite deferment of National Service was granted to first and second class honours graduates in mathematics and science to take up posts in schools. In 1956 about 200 graduates were so deferred. Moreover, in 1955 and 1956 improvements were made in the salaries of teachers. Efforts are also being made to bring teaching as a career to the attention of science graduates, and closer relations between schools and industry are being encouraged. In particular, an arrangement has been made by which a number of teachers are given vocational attachments at the Royal Aircraft Establishment at Farnborough and the Radar Research Establishments at Malvern. In addition, universities and a large number of industrial firms provide refresher courses and conferences for science teachers. At the instigation of both the National Advisory Council on the Training and Supply of Teachers and the Government, improvements were recently made in the science curriculum of teacher colleges.[5]

Counselling and Propaganda in Secondary Schools.

Certain measures have also been taken in order to win scientific talents for universities by proper counselling and propaganda, and to

[1] *Chemical and Engineering News* (American Chemical Society), Vol. 35, No. 19, 13 May 1957, pp. 44 ff.

[2] *Hearings . . . on Development, Growth, and State of the Atomic Energy Industry*, op. cit.

[3] *Chemical and Engineering News*, Vol. 34, No. 53, 31 Dec. 1956, pp. 6378 ff.

[4] Ibid., No. 50, 10 Dec. 1956, pp. 6074 ff.

[5] *Parliamentary Debates. (Hansard). House of Commons. Official Report* (London, H.M. Stationery Office), Vol. 567, No. 78, 22 Mar. 1957.

persuade a large number of gifted pupils to continue education instead of taking up posts in industry immediately after secondary school.

In the United States, for instance, the Public Employment Service has during the last few years worked out a co-operative counselling and placement programme with an increasing number of schools. Under this programme, trained employment service officers administer aptitude tests to large numbers of students during the last year of secondary school. These tests have apparently been useful in many instances in uncovering latent ability needed in many professional fields experiencing a shortage of entrants. In addition, the recent George-Barden Act provides the basic structure for an expansion of the general guidance service in schools, of which at present only 20 per cent. have specialised guidance personnel.[1]

In Switzerland, under a plan which is being prepared for the development of atomic energy centres, measures are envisaged at the secondary-school level to induce more young people to study nuclear physics in order to fill the 400 specialist posts which will be available.[2]

In Great Britain a valuable part in the task of informing young people about employment opportunities opened by technological advance is played by the Youth Employment Service. This service is in a very good position, through the talks on careers that it arranges in schools as well as in its individual advisory work, to inform young persons of the range of openings available and to advise them on ways and means of obtaining training for the various occupations; in many cases the service may do the most good by influencing the young person to continue in full-time education rather than seek immediate employment.[3]

In France a recent circular sent by the Ministry of Education to all rectors of secondary schools, and which will also be distributed to pupils and parents' associations, stresses the urgent necessity of directing a larger number of pupils towards scientific studies. While it is expected that a future reform of the educational system will permit more judicious guidance of youth, the circular underlines the need for giving, within the present framework of education, such information and advice to families as will enable them to use their authority with a full knowledge of the possibilities offered by the school and in accordance with the aptitudes of the young persons concerned. This action is expected also to increase the number of secondary school graduates in humanities taking advantage of the newly created reconversion classes leading to the *baccalauréat* in mathematics.[4]

In a fast-developing country like India vocational guidance and occupational information play an important role in the effort to attract young persons to new occupations. It is expected that the recently created vocational guidance organisation will divert an increasing number of students from overcrowded college courses in arts subjects to technical and scientific studies. While preliminary guidance of young persons is left to the schools, the National Employment Service of India has undertaken to supply school vocational guidance units with the necessary occupational and employment market information.

[1] "Skilled Worker Shortages in Our Changing Economy", in *The Labor Market and Employment Security* (Washington, U.S. Department of Labor), Nov. 1956, pp. 6-10.

[2] Frank BRIDEL: "Il nous faut 400 atomistes", in *Tribune de Genève*, 16 May 1957.

[3] Ministry of Education, Great Britain: *Technical Education*. (London, H.M. Stationery Office, 1956).

[4] Circulars of 20 and 21 Mar. 1957, in *Bulletin officiel de l'Education nationale* (Paris), No. 14, 28 Mar. 1957, pp. 1121 and 1123.

An experimental Youth Employment Office which was recently created in Delhi is the first of fifty or more youth employment offices that it is planned to set up under the second five-year plan.[1]

Financial Aid to Students.

Arousing the interest of young persons in science and technique will not, however, bring them to the universities if they cannot afford to continue their education beyond secondary or elementary level. In a number of countries there are complaints about the inadequacy of the scholarship system. Certain persons wish to see financial aid given not only to university students but also to needy pupils in secondary schools. This point has especially been stressed in Switzerland, where it is felt that a sufficient number of scholarships in secondary schools would attract many more children from mountain regions and those coming from workmen's families. It is also considered that, since prejudices against technical and scientific professions do not exist in these environments, such a solution would eventually mean a large increase in the number of university students in science and engineering faculties.[2]

In certain countries, as in the U.S.S.R. and the United Kingdom, the system of university scholarships is very well developed, inasmuch as approximately three-quarters of all university students receive subsidies sufficiently high to enable them to devote all their time to their studies. The United Kingdom Government intends to increase further the number of scholarships by granting state and other scholarships especially intended for technical and scientific studies. These scholarships will be extended also to graduates from schools training technicians, who are now allowed to enter universities without the normal certificate from grammar school. Furthermore, a large number of industrial undertakings help in financing the studies of their employees who attend the so-called " sandwich courses "—a system under which half-a-year's work in industry is alternated with university studies for the rest of the year—or are otherwise granting scholarships which do not require students to enter the particular firm in question after graduation.

Although a large number of scholarships are provided in the United States by the Government, and by industry, scientific funds and associations, etc., it was found that in 1955 between 60,000 and 100,000 high-school graduates of university ability failed to enroll for financial reasons.[3] A number of Bills have been introduced in recent sessions of the United States Congress providing for special subsidies to assist students in the field of science and engineering.

Expansion of University Facilities.

A certain number of countries plan to increase the number of science and engineering courses offered in universities and to expand the capacity of the latter.

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[1] S. O. Doos : " Vocational Guidance in India ", in *Employment News* (New Delhi, Ministry of Labour), Oct. 1956.

[2] " Des mesures propres à promouvoir le recrutement et la formation de personnel scientifique et technique doivent être prises sans tarder ", in *Bulletin d'information du Délégué aux possibilités de travail et à la défense nationale économique* (Berne), June 1957. See also " La relève de nos techniciens et hommes de science est-elle assurée ? ", ibid., Nov. 1955.

[3] *The Growing Shortage of Scientists and Engineers*, op. cit.

In Australia it is suggested that there should be closer relationship between universities and technical colleges and that arrangements should be made under which those who prove incapable of taking university degrees might transfer to courses of a lower standard.

In Great Britain in 1956 Parliament adopted a programme involving the expenditure of more than 100 million pounds and aimed at extending the Imperial College of Science and Technology in order to raise student enrolment from 1,600 to 3,000, expanding schools for the training of technicians and raising a number of them to university standard, and providing for the grant of scholarships.

In France a National Institute of Applied Science will be opened in Lyons towards the end of 1957, with a student capacity of about 1,200. Candidates will be admitted without entrance competition. A guidance system practised in the first years of study will direct students of the new Institute either to courses leading to diplomas in engineering or to those training highly qualified technicians, according to their aptitudes and desires. As an additional measure, the number of students to be admitted to the national engineering universities has been increased by 30 per cent. for the academic year 1956-57.

In India the All India Council of Technical Education recently endorsed, in principle, certain proposals of the Engineering Personnel Committee to set up five new technical universities in Andhra, Assam, Madhya Pradesh, Orissa and Punjab respectively. In addition, the existing capacity of a number of other universities is to be expanded and post-graduate courses provided in fifteen colleges. This will make it possible to increase the output of engineering graduates to 7,500 per year, compared to less than 3,000 in 1954.

In the United States a number of universities have already substantially increased their courses in science and engineering, and industry has helped to provide laboratory facilities and other equipment.

In Switzerland the Delegate for Employment Opportunities recently organised a conference, attended by representatives of federal and cantonal authorities, the Federal Technical Institute in Zürich, universities and secondary schools, the vocational guidance services, economic and professional associations, research foundations, etc. This conference set up a commission to examine the recruitment situation of scientific, engineering and technical personnel, the need of universities for assistance, and the possible extension of technical schools, as well as the legislative, economic and administrative measures required in order to increase technical and scientific staff.

In the U.S.S.R. the sixth five-year plan stresses the importance of suitably locating universities throughout the country and provides for enlarged training facilities for specialists in the Urals, Siberia, the Far East and Kazakhstan. Special provision is also made for the development of evening and correspondence courses conducted by higher schools and specialised secondary schools in order to give persons holding technical engineering jobs, as well as workers and collective farmers, the means of obtaining higher or specialised education.

The pace of expansion of institutional facilities will, however, in all cases be conditioned by the availability of teaching staff, which in many countries is in short supply. Various measures to solve this problem have already been taken or contemplated, among which a rise in the salaries of university professors and research assistants is considered to be one of the most effective.

Raising the General Attractiveness and Prestige of Scientific and Engineering Professions

Certain countries feel that advice and propaganda in favour of technical and engineering occupations should be designed to dissipate negative social attitudes towards these occupations and to make the public more conscious of the contribution of science and technique to prosperity and social progress.

In Switzerland it is believed in some quarters that the first aim of present efforts to increase the supply of engineers and scientists should be to render these professions more attractive. Materially, the present supply and demand situation has already resulted in much better financial conditions for this group of personnel than prevailed in the past, although this does not yet apply to those belonging to the older generation, nor to scientists and engineers occupied in research institutes and in teaching. On the other hand, industry can help much, it is felt, in raising the prestige of these professions. The fact that many undertakings overrate commercial and administrative functions, as opposed to technical and scientific occupations, has resulted in large numbers of engineers or scientists not being given responsibilities commensurate with their training and knowledge ; as a result, they often lose all interest in the organisation and functioning of the undertaking. It has been suggested that those who occupy key positions in industry should endeavour to replace old-fashioned patriarchal conceptions, where they exist, by a team spirit and give qualified engineers and scientists an opportunity to advance to the higher positions in the hierarchy. It will also be necessary to change negative attitudes deriving from the period of twenty years ago, when employment opportunities for scientists and engineers were very unfavourable, a situation that is not likely to arise again.

In economically underdeveloped countries, prejudices against technical and scientific occupations and a traditional preference for civil service posts are a serious obstacle to economic expansion. It is, moreover, increasingly recognised that requirements for scientific and technical personnel should be met from national sources, particularly in view of the shortage prevailing in western countries, which makes it unlikely that such personnel can be brought in from abroad in sufficient numbers.

A recent survey carried out in Ceylon [1] has shown that the great majority of secondary-school boys give civil service occupations as their primary choice. Although training in practical fields is available very few students choose it. It has been suggested that the Government should raise the prestige and attractiveness of practical work by setting its own pay scale higher for such occupations. In addition civil service examinations should, it is felt, be revised so as to give emphasis to problem-solving ability in science and technical fields.

In South Africa, where the shortage of engineers is in part due to the lack of entries into the universities during the Second World War, the South African Council of Scientific and Industrial Research is at present endeavouring—within the limits of its competence, which embraces more particularly the field of university education—to popularise science among the youth of the country. It has also been suggested that salaries for engineers and scientists should be made more attractive.

[1] Theodore MORGAN : " The Economic Development of Ceylon ", in *Annals of the American Academy of Political and Social Science* (Philadelphia), May 1956, p. 92.

Some progress has been made in recent years in India in dissipating prejudices against technical studies and industrial employment, partly as a result of the interesting opportunities that are at present open to engineers. The recent granting of scholarships to outstanding students in science and technical subjects may also have had a favourable effect. In order to remedy the great difficulty that government departments experience in securing engineers of high standing and to enable the planning and execution of the engineering and industrial projects which form a major portion of the total outlay of the second five-year plan, it is intended to provide adequate incentives in terms of prestige and remuneration by creating an All India Service of Engineers. Members of this service would be trained along uniform lines so that they would have common standards of efficiency and a unity of purpose. It is also intended to include technical and scientific personnel in the general administrative machinery of the civil service.

According to the findings of the National Industrial Conference Board and of various engineering societies in the United States there is general dissatisfaction in the engineering profession mainly because many companies do not fulfil the engineer's desire to be classified as part of the management team. The fact that there has been increased unionisation amongst engineers—12 per cent. are at present organised—is regarded as a sign of this dissatisfaction.[1] In recent discussions the National Industrial Conference Board has come to the conclusion that, besides providing adequate material compensation, management should give industrial engineers a place in the management team and treat them in accordance with their professional status by allowing them time and facilities for research, study, reading, publishing, and the like and by not assigning them to tasks requiring little engineering ability.

In a general effort to improve the material situation of engineers and scientists it has been suggested in France that industrial engineers and scientists should be entitled to a share of the profits resulting from inventions and discoveries.

Women as Engineers and Scientists

Specific attention is given by a number of countries to the problem of interesting a greater number of young women in science and engineering.

In the United Kingdom the Ministry of Education[2] states that the reserve of talent among young people, which could be developed by further education, is greater among girls than boys and that hundreds of thousands of young women are not making the best use of their aptitudes because they have stopped education after secondary school or earlier. In order to relieve the shortage of teachers for mathematics and science courses—which is even more pronounced in girls' than in boys' schools—it is suggested that girls who have decided to take up teaching should be induced, by means of suitable vocational guidance, to choose science or mathematics as their special subject.

A study of training and employment opportunities in various engineering fields in the United Kingdom prepared by the Women's Engineering Society in 1955 in an effort to encourage more women to

[1] "Unionism among Engineers", in *Chemical and Engineering News*, Vol. 35, No. 1, 7 Jan. 1957.

[2] *Technical Education*, op. cit.

enter those fields points out that the newer branches of engineering, such as aeronautics, electrical and electronic engineering, and heating and ventilating, offer an easier entry to women than do the older branches of engineering.[1] Although entry is still not as easy for girls as for boys, it is suggested that there is no reason why a girl with talent and determination should not embark on an engineering career with every chance of success.

In the United States the need to increase the number of posts available to technically trained women is also stressed. A recent study by the United States Women's Bureau concerning the current and future demand for women in mathematics and statistics, pays particular attention to the employment possibilities of married or older women who wish to re-enter the professions, and for whom refresher courses are available. It also suggests that young women who combine qualifications for teaching with ability in mathematics should be encouraged to teach, at least part-time.

A report issued in Canada [2] deals with the situation of women employed in science and engineering. It is based on the records of some 800 women who have qualified in various fields and have completed questionnaires for the Technical Personnel Register of the Department of Labour, and reveals the present distribution by professional specialisation, and the functions performed by women. This shows that the great majority of women are working in research, testing, inspection and laboratory services, and in teaching.

Proper Utilisation of Existing Staff

Specialised Placement Services

In an effort to utilise existing manpower as fully as possible, a proper organisation of placement activities concerning scientific and technical personnel has been found to yield satisfactory results.

Experiments have been made in particular in the United States, where specialised services for professional personnel have been established in some local employment offices.[3] A particular need was felt also for a system of job placements extending beyond local and state areas because of the scarcity of specialised personnel and the fact that, in an increasing number of instances, the areas of greatest employment opportunity are far removed from the employment agencies of the large cities.[4] A professional employment network, largely concerned with engineering and scientific personnel, was established in 1956 with a participation of some 300 local offices in several states, and it was planned to extend this service to the whole country.

In India, besides stressing the need for an effective placement organisation in this field, the Engineering Personnel Committee has underlined the importance of creating suitable machinery to co-ordinate the release of surplus personnel from finished projects and their absorption in others.

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[1] *Engineering Training for Women* (The Women's Engineering Society, 1955).

[2] Department of Labour: *Report on Women in Science and Engineering* (Ottawa, Sep. 1956).

[3] Eugene Kreul: "Pattern for a Professional Placement Program" in *Employment Security Review* (Washington, U.S. Department of Labor), Vol. 23, No. 12, Dec. 1956, p. 9.

[4] "Long-Distance Recruiting", in *Chemical and Engineering News*, Vol. 34, No. 44, 29 Oct. 1956, p. 5250.

Older Persons

In spite of the general shortage, there is some unemployment among older engineers and scientists ; this problem is now receiving attention in a number of countries. It appears to be caused mainly by the fact that employers prefer to recruit and train young persons and to promote them from within the undertaking. As one means of solving this problem in the United States, the advisory Committee on Science Manpower, appointed by the New York City Board of Education, has been considering the possibility of recommending the employment of retired scientists and engineers for teaching posts in secondary schools in order to make good the critical shortage of science teachers.[1]

Proper Utilisation of Skills

The widespread shortage of highly qualified personnel is in some cases aggravated by the fact that engineers and scientists are employed in work which technicians, laboratory assistants and other supporting personnel can perform equally well. But the shortage of the latter category is generally at least as serious as that of university-trained personnel, and extensive efforts are being made to remedy this situation.

In Australia, where the annual output of science and engineering graduates is expected to increase substantially as a result of demographic evolution alone, it is felt that attempts to induce students to undertake training for scientific or engineering careers should not be prosecuted too vigorously as this might entail drawing on the class which provides the best apprentices and potential technicians. It is also suggested that the quickest way of advancing technology would be to strengthen the supporting scientific and technical labour force (up to the technical college diploma level).

In the United States a special conference on the effective utilisation of scientific and engineering personnel, sponsored by Michigan State University and attended by representatives of universities, engineering societies and industry, was held early in 1957.[2] Moreover, the National Science Foundation has requested the Bureau of Employment Security to draw up a list of technical jobs which support engineers and scientists, in order to be able to plan for suitable measures.

The Engineering Personnel Committee of the Government of India considers that the expensive overseas training of engineers—during the last few years some 200 persons were trained in this way each year—would be more effective if training were directed in each case at fitting the engineer for a particular post awaiting him on his return to India, and that for this reason the curriculum of students should be outlined beforehand. This would also obviate the loss of some of these graduates who take positions abroad upon completion of their training for lack of appropriate opportunities to utilise their knowledge in their homeland.

SUMMARY

The shortage of engineers and scientists cannot be remedied without a full understanding of two principal factors influencing the supply

[1] See *Chemical and Engineering News*, Vol. 34, No. 32, 6 Aug. 1956, p. 3745.

[2] See *Effective Utilisation of Engineering Personnel, Proceedings of a Conference at Michigan State University, March 29 and 30, 1957* (Michigan State University, 1957).

of this type of personnel, namely interest on the part of young persons in scientific and technical subjects, and their attitudes towards the corresponding professions.

The need to stimulate interest at an early age and the part to be played by secondary schools in this respect are recognised everywhere.

But the general shortage of teachers, particularly in the sciences, raises a further serious difficulty. In many instances science courses in secondary schools, far from being expanded, have had to be reduced to a minimum, and it has often been necessary to engage insufficiently trained teachers. The primary importance of providing more teachers for science classes is recognised in all countries, and certain measures, consisting mainly in organising and financing special training courses for science teachers, giving them industrial attachments, and raising their salaries, have already been taken.

Guidance services in secondary schools can play a part by encouraging students who are interested in scientific subjects to continue their studies in that field instead of selecting other subjects, possibly leading to occupations which offer less opportunity, or even of breaking off their studies to take up work in industry. They can likewise help to eliminate prejudices against scientific and technological occupations.

Women probably represent an important reserve of scientific and technical personnel, although, apart from natural sciences, these fields do not at present attract many women. This is largely due to social prejudices and to the attitude of industry, which traditionally prefers to recruit men for such posts, partly because of the fear of losing women scientists and engineers on their marriage after they have been trained. However, a substantial increase in the number of women graduates in science and engineering would undoubtedly contribute to solving the shortage of teachers; many can be expected to be attracted to this profession, which offers long paid holidays and other advantages and which can more easily be pursued by a married woman with children than industrial employment. The suggestion has also been made that industry should provide part-time posts for married women.

The relatively lower prestige enjoyed by scientific and technical professions in comparison with other professions is another major cause of present shortages. Public opinion has to be convinced of the value of technical and scientific occupations. Industry can do much to achieve this, particularly by offering the personnel concerned the same opportunities for advancement as those open to administrative personnel, and by having scientists and engineers participate in the management of the undertakings without being taken away from their professional fields. These measures, combined with material advantages, would help to create an enthusiasm among this personnel, which is necessary to influence public opinion favourably and to attract young persons to these professions. A great effort of persuasion will be required in economically underdeveloped countries where prejudice against scientific and technical professions is particularly strong.

Scholarship systems enabling needy students to pursue secondary studies and to take up university studies are, of course, essential in any effort to increase student enrolment. While large capital outlays are required for such financial assistance, as well as for the expansion of university space and equipment, they are usually and rightly considered as an investment in the future of the economy as valuable as any other investment.

Specialised placement services, which assist employers in getting

personnel with the required qualifications and facilitate long-distance recruitment for specialist posts, can play a useful part in ensuring that available personnel is used to the best purpose. The same end can be furthered by increasing the supply of supporting staff, such as technicians and laboratory assistants.

The present shortage of scientists and engineers and the constantly growing demand for them make it imperative to take effective remedial measures in the very near future. These measures are all the more urgent in view of the long training period required for these occupations. Their success will depend on the extent to which the public authorities, industry, labour, educational establishments and the general public work together towards a common solution.

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This Report and six technical reports [1] correspond to the seven items on the agenda of the 41st Session of the International Labour Conference, which will be devoted exclusively to the consideration of maritime questions. In it the Director-General of the I.L.O. first reviews the record of progress in seafarers' conditions from 1946 to 1957, i.e. since the last maritime session of the Conference was held, under the following headings : expansion and development of the world shipping industry ; employment and employment organisation; training; wages and hours; accommodation; holidays with pay ; social security ; welfare ; and labour-management relations. A second chapter is devoted to the work of the I.L.O., as well as its co-operation with other international organisations, in the maritime field since 1946.

Other Documents.

National Employment Services : Belgium. Geneva, 1957. viii+128 pp. 75 cents ; 4s. 6d.

This is the fourth in a series of handbooks [2] designed to bring together and make available in comparable form a survey of employment service policy, practice and techniques in various countries and so to serve as a guide for development and improvement in this field and to assist in solving particular problems of organisation or operation.

The present handbook, which was prepared by the Belgian Ministry of Labour and Social Insurance working in co-operation with the National Placement and Unemployment Office, is presented in conformity with a uniform plan adopted for the series. An introductory chapter is followed by an account of the general administrative organisation of the service. Chapter III describes in detail the functions, programme and procedures of the service under such heads as statement of policies, organisation of placement work, employment information, employment counselling, service to special categories of workers and special industries and co-operation in economic and social planning and administration. Chapters IV to VII deal respectively with the organisation and operation of advisory committees, the recruitment and training of employment service staff, private employment agencies and employment service research activities.

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[1] See *International Labour Review*, Vol. LXXVI, No. 5, Nov. 1957, p. 513.

[2] The first three, published in 1950, 1952, and 1955, dealt with Canada, the United Kingdom and the United States.

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Organisation for European Economic Co-operation.

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This volume contains the papers delivered at the First Information Conference on Nuclear Energy for Management, organised by the O.E.E.C. in April 1957. They cover the technical, economic and industrial aspects of nuclear energy ; the industrial uses of radio-isotopes ; and the progress made in the development of nuclear energy in Western Europe and the United States, with some brief mention of international and European regional bodies for the promotion of the peaceful uses of nuclear energy.

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Contains the results of on-the-spot inquiries which the authors carried out in several countries, together with practical conclusions in which they suggest certain ways in which productivity could be increased in agriculture by work simplification.

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TSUNETA YANO MEMORIAL SOCIETY. *Nippon. A Charted Survey of Japan, 1957.* Third edition. Tokyo, Kokusei-Sha, 1957. xviii+265 pp.

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* Mention of a book without a note does not preclude publication of a note in a subsequent issue of the *Review.*

Social and Economic Questions.

ASHER, Robert E., KOTSCHNIG, Walter M., BROWN, William Adams, Jr., and associates. *The United Nations and Economic and Social Co-operation.* Washington, The Brookings Institution, 1957. xi+561 pp. $2.50.

This monograph was issued as part of a comprehensive series of studies of the United Nations which has been in the course of preparation by the International Studies Group of the Brookings Institution since 1949. It is intended to constitute the second part of a forthcoming volume to be entitled *The United Nations and Promotion of the General Welfare*, and consists of a thorough and carefully documented historical survey of the work of the United Nations and the specialised agencies in the economic and social fields. As such, it provides excellent background material on the subject and constitutes a rich source of information on economic and social action at the international level.

A detailed account of the emergency relief and technical assistance programmes of the United Nations and its related agencies is presented, together with a realistic appraisal of their inherent weaknesses. Considerable space is also devoted to tracing developments in the debate concerning the financing of the economic and social growth of the underdeveloped countries through the United Nations institutions.

In a review of the evolution of the United Nations, its organs and the specialised agencies during the past ten years, it is pointed out that the development has taken a course substantially different from that envisaged by the framers of the United Nations Charter. In view of these divergences from the theoretical blueprint, it is suggested that this lack of rigidity has enabled the organisations concerned to discover by experience the most rewarding areas for international economic and social co-operation—and the limits of such co-operation. For this reason the writers feel that a continuation of this pragmatic, evolutionary approach is preferable to legislative action for the purpose of modifying charters, constitutions, articles of agreement and terms of reference.

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This book deals with two main aspects of " practical automation ": how to determine where to use automatic methods of production and then to apply them, and how to handle the new management problems arising with new methods of production. It covers all the stages of application of automatic methods (the planning preceding the introduction of automation, the introduction of the new methods, plant engineering and maintenance) in different sized plants in different industries (a special chapter deals with automation in job shops and small plants). The last section of the book is devoted to the management of automation : solving management problems ; computers, information processing and management controls ; and managing people under automation. The authors believe that management skills will be put to the test by automation but that the answer to better employee relations lies not in any new technique of human relations but rather in accepted and tested personnel methods of progressive and democratic management. A brief bibliography is included.

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BRITSCH, Jacques. *Perspectives sahariennes.* Preface by General O. MEYNIER. Paris, Charles-Lavauzelle et Cie, 1956. 122 pp.

The first two chapters of this book are given over to purely geographical considerations—physical geography in the first place, followed by human geography. The pattern of government of the various regions that make up the French Sahara is described briefly, while a few pages are devoted to an examination of the economic potential of the Sahara belt (mineral wealth, prospecting for petroleum, manpower and communications). In particular, the adaptation of the desert dwellers to modern working conditions is illustrated by various examples taken from the collieries in the south of Oran and the mines in Mauritania. The latter part of the work deals with the plans for the political and administrative organisation of the Sahara. The author declares himself in favour of the administrative unification and legal assimilation of the Sahara territories to metropolitan France, and cites political and economic as well as military arguments in support of his position. Further information is provided in an appendix in the form of certain population statistics, a number of official documents and a comprehensive sketch map of the Sahara.

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An analytical, but not too technical, treatise on planning, with special reference to India. Part I gives a short and clear exposition of various concepts relating to planning techniques, with special reference to underdeveloped economies. Part II consists of a critical analysis of the basic techniques of India's First and Second Five-Year Plans in the light of planning experience in Russia, China and Poland.

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This booklet aims to provide information on the background and some of the practical effects of the work of Norwegian experts in United Nations programmes for technical assistance to underdeveloped countries. A teacher, an engineer, a doctor of medicine, two economists, a marine biologist and a professor of geography tell their stories about missions abroad, describing the different problems they tackled, their experiences and accomplishments.

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Rural development programmes are assuming increasing importance in the development plans of various underdeveloped countries, particularly in Asia. In India, where the community development programme has entered its fourth year and where it is to be extended over the whole country during the Second Plan (1956-61), its contents and methods have already undergone considerable change since it was started and are expected to be modified further in the light of new experience. This *Evaluation Report*, the third annual report of its kind, provides a critical evaluation of the progress of the programme. It emphasises specific trends in individual fields of development, the achievements of the programme in each field, the difficulties and problems faced, and the changes that need to be made in content or method so that the rural development programme may be carried out more effectively.

POLITICAL AND ECONOMIC PLANNING. *Three Case Studies in Automation.* London, 1957. vi+58 pp. 7s. 6d.

A report on three case studies of the introduction of automatic technology in the United Kingdom, prepared for and presented to the Conference on Automation held in Paris in April 1957 under the auspices of the European Productivity Agency of the O.E.E.C.

The first case study concerns the manufacture of bearing tube. It describes the technical differences between the methods used before and after the introduction of more automatic methods and briefly indicates the economic and social effects of the change. The second, illustrating continuous-flow production and based on modern refinery practice, briefly describes automatic control in a typical modern plant and makes indirect comparisons with an older plant using different methods and doing an essentially different job. The third concerns the well-known LEO (Lyons Electronic Office) and shows how the electronic computer is being applied to routine clerical work and used as a management tool. The Lyons Company is at one and the same time manufacturer and user of office equipment.

As is pointed out in the introduction, the case studies confirm the general trend of thinking reflected in the report on automation issued in 1956 by the Department of Scientific and Industrial Research of the United Kingdom.[1] These studies fill in part of this framework with some interesting but relatively minor points. They seem, however, to lack adequate statistical and social-science grounding and to draw rather general and far-reaching conclusions from subjective observation and limited data.

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VILA, Marco Aurelio. *Geografía del Tachira.* Caracas, Corporación Venezolana de Fomento, 1957. 449 pp.

This work, published by the Venezuelan Development Corporation, is the eighth in a series of geographical monographs on the different states of Venezuela. Its author, Professor Marco-Aurelio Vila, is both a geographer and a geologist. The study in question, which is arranged in three parts, consists of an account giving the background of the region (history, political and administrative evolution, geology, water resources, climate and population) a detailed analysis of the various parts of the state of Tachira (the Tachira Depression, the Cordillera, Montaña de Tamia, the northern plains

[1] *Automation : A Report on the Technical Trends and Their Impact on Management and Labour* (London, H.M. Stationery Office, 1956).

and the *Ilanos* region), and a discussion of the various aspects of the state's economy. The state of Tachira is one of the areas in Venezuela which still has a sizable indigenous population, and a brief history of the Indian population of the area and their relations with the Spaniards at the time of the Conquest will be found in the opening chapter. Also contains a bibliography, a map and numerous photographs.

WOYTINSKY, W. S. *India, the Awakening Giant.* New York, Harper & Brothers, 1957. xv+201 pp. $3.75.

A study, in a simple and popular style, of modern India, particularly of the economic and social changes which have taken place since independence. The book deals mainly with India's plan for industrialisation and revival of village economy; it also discusses briefly other problems, such as education, social welfare, and the different economic ideologies prevailing in India.

Statistics.

АКАДЕМИЯ НАУК СССР. *Ученые записки по статистике, том II. Статистические методы в промышленных исследованиях.* Moscow, Издательство Академии наук СССР, 1956. 340 pp. 17.80 roubles.

This is the second volume of the series of scholarly papers on statistics issued by the Academy of Sciences of the U.S.S.R. It is principally devoted to statistical methods in industrial research, with primary emphasis on sampling and estimation techniques and statistical control procedures. A paper on small-sample methods in quality control is also included.

The final third of the volume covers a miscellany of subjects—labour productivity in agriculture, methods of discovering reserves of working time in production, load analysis in planning automatic telephone centrals, economic indicators for passenger transport, the classification of national income and product in " bourgeois statistics ", and price indices and the purchasing power of money.

CENTRAL STATISTICAL BOARD, Council of Ministers, U.S.S.R. *National Economy of the U.S.S.R.* Moscow, Foreign Languages Publishing House, 1957. 230 pp.

This book, which contains statistical data regarding the economy of the U.S.S.R. that have until recently been available only in Russian, presents a statistical picture of the economy in 1955, with comparative data for earlier years reaching back, in some cases, to 1913. Among the data presented are basic demographic statistics, statistics on the nature of industry and of industrial production, and statistics on agriculture, construction, transportation and communications, trade, education and public health. Certain information on the labour force is also provided. Various comparisons with other countries are afforded, relating chiefly to area and population.

A great deal of information is given in absolute terms, suitable for many types of analysis, e.g. numbers of automobiles, trucks and tractors produced, tons of cement, tons of steel, etc., produced. Information is also given in absolute terms on crop areas, numbers of livestock, and various other items. Some information, however, is presented only in relative terms, e.g. the amount of agricultural production, the growth of the national income and increase in real wages.

ГОЗУЛОВ, А. И. *История отечественной статистики.* Moscow, Госстатиздат, 1957. 180 pp. 6.65 roubles.

A history of national statistics, by A. I. Gozulov.

НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ КОНЪЮНКТУРНЫЙ ИНСТИТУТ МВТ СССР. *Развитие народного хозяйства Китайской Народной Республики.* (Статистические показатели). Moscow, Внешторгиздат, 1956. 51 pp. 0.60 rouble.

This pamphlet summarises the principal statistical indicators of the Chinese People's Republic from 1950 to 1955, with some preliminary figures

for 1956. The fields covered are population, industrial and agricultural production, transport and communications, trade, wholesale prices, education, health, and social insurance.

Ряузов, Н. Н., and Тительбаум, Н. П. *Статистика советской торговли.* Moscow, Госстатиздат, 1956. 272 pp. 6.20 roubles.

Soviet trade statistics, by N. N. Riauzov and N. P. Titelbaum.

Центральное статистическое управление при Совете министров СССР. *Народное хозяйство СССР в 1956 году. Статистический ежегодник.* Moscow, Госстатиздат, 1957. 295 pp. 11.50 roubles.

The national economy of the U.S.S.R. in 1956. Statistical year book published by the Central Directorate of Statistics of the Council of Ministers of the U.S.S.R.

Industrial Relations ; Employers' and Workers' Organisations.

Alba, Víctor. *Esquema histórico del movimiento obrero en América latina.* Colección " Panoramas ", vol. 8. Mexico City, B. Costa-Amic, 1957. 155 pp.

Британский тред-юнионизм. Пять очерков института политического и экономического планирования. Новое исправленное издание. Перевод с английского Л. Яковлева. Moscow, Издательство ВЦСПС профиздат, 1956. 206 pp. 6.25 roubles.

British trade unionism. Russian translation of five studies originally published by Political and Economic Planning (P.E.P.).

Fawzi, Saad Ed Din. *The Labour Movement in the Sudan, 1946-1955.* Issued under the auspices of the Royal Institute of International Affairs. London New York, Toronto, Oxford University Press, 1957. xiv+175 pp. 25s.

Gradilone, Alfredo. *Storia del sindacalismo.* I : *Inghilterra.* Milan, Dott. A. Giuffrè, 1957. iv+332 pp. 1,500 lire.

La Fournière, Michel de, and Borella, François. *Le syndicalisme étudiant.* Foreword by Paul Bouchet. Paris, Editions du Seuil, 1957. 188 pp.

Labor Research Association. *Labor Fact Book, No. 13.* New York, International Publishers, 1957. 160 pp. $2.50.

This is the latest in the series of books issued in the United States under this title at two-year intervals since 1931. It summarises economic trends for the last two years, labour and social conditions and the trade union movement, etc. A chapter is devoted to conditions of the Negro people.

Lefranc, Georges. *Le syndicalisme en France.* Paris, Presses universitaires de France, 1957. 126 pp.

Младенов, М. and Димитров, Н. *Профсъюзната финансова дисциплина.* Sofia, Профиздат, 1957. 124 pp. 3 levs.

Financial management of trade unions, by M. Mladenov and N. Dimitrov.

National Association of Manufacturers. *Satisfying the Salaried Employee.* A Practical Manual for Building Better Relations with All Categories of White Collar People. New York, 1957. 64 pp. 50 cents.

In order to examine the needs of salaried personnel and point the way to their solution, the National Association of Manufacturers in the United States set up an Advisory Committee whose findings and suggestions are embodied in this practical manual. Its purpose is clear from a statement in the introduction to the effect that " the salaried employee today is being wooed by both unions and management. This contest for his support will be won by the one which recognises the real needs and desires of the

salaried group and provides the answers which will bring satisfaction. The outcome of this contest may very well rest on management's action at this critical juncture." All categories of salaried employees are covered, as are questions of status and recognition, compensation, communication and supervision.

TRADES UNION CONGRESS, United Kingdom. *Report of Proceedings at the 89th Annual Trades Union Congress, Held at the Opera House, Blackpool, September 2 to 6, 1957.* Edited by Sir Vincent TEWSON. London, 1957. 543 pp.

Labour Law.

L'application des conventions internationales du travail aux travailleurs étrangers. Offprint from the *Revue critique de droit international privé*, 1957, No. 1. Paris, Librairie Sirey, 1957. 12 pp.

This brief study discusses the extent to which a State ratifying an international labour Convention is required to apply its provisions to foreign workers residing within its territory. From a rapid review of the various Conventions adopted by the International Labour Conference since 1919, and the clauses contained in these instruments, the conclusion is reached that, except where otherwise provided, " foreign workers employed within the national territory of a member State of the Organisation should as a rule be entitled to the benefit of the protective measures provided for in the Conventions ratified by that State ".

MAZZIOTTI, Manlio. *Il diritto al lavoro.* Università degli studi di Roma, Monografie dell'Istituto di diritto pubblico della Facoltà di Giurisprudenza. Nuova serie, No. 9. Milan, Dott. A. Giuffrè, 1956. 389 pp. 2,000 lire.

The Italian Constitution declares that " the Republic recognises the right of citizens to work, and promotes conditions that render this right effective ". In discussing the significance of this declaration, the author makes the point that all this amounts to is a mere directive calculated to guide the legislature in its activities, and not a canon of positive law capable of practical application as it stands. The true meaning of the right to work is freedom to work and carry on an occupation, it being understood that this freedom embraces every kind of work, whether wage earning or independent, and includes that of the entrepreneur. However, the right to work as understood by the Italian Constitution does not connote any obligation on the State to provide a job for the involuntarily unemployed ; the State is merely called upon to create a situation in which every citizen can find employment.

Having thus defined the right to work as one of the fundamental freedoms guaranteed by the Constitution, the author goes on to discuss it in correlation with other freedoms of the same kind, such as equality before the law, freedom of movement and sojourn, freedom of private economic initiative, the right of ownership and freedom of industrial organisation. Speaking of the latter, he affirms that it " fits into the framework of freedom of private economic initiative and is complementary to it " and its effect is that " labour relationships grow up not in accordance with mandatory directives issued by the State, but rather in accordance with the will of the occupational associations, whose activities are curbed but not steered by the public authorities ".

In the last chapter the author examines, from the standpoint of constitutional law, a number of measures designed to guarantee the right to work in practice, especially those relating to the employment service, the compulsory hiring of disabled persons and various projects launched to achieve full employment.

MOLITOR, Bernhard. *Der Anspruch auf Beschäftigung im Rahmen des Arbeitsvertrages.* Munich, UNI-Druck, 1957. xviii+79 pp.

PEŠIĆ, Ratko. *Medzunarodne konvencije rada.* Zbirka konvencija koje je F.N.R. Jugoslavija ratifikovala sa komentarom. Belgrade, Nova administracija, 1957. 279 pp. 700 dinars.

List of international labour Conventions ratified by the Federal People's Republic of Yugoslavia, with commentary.

STANG, Emil (editor). *Dommer og Kjennelser av Arbeidsretten, 1955.* Oslo, J. Chr. Gundersens Boktrykkeri, 1956. xvi+193 pp. 31.20 kroner.

Contains a summary of the judgments and decisions rendered by the Norwegian Labour Court during 1955.

STAPELKAMP, G. J. *De bedrijfsraad voor het bouwbedrijf.* Theorie en praktijk der bedrijfsradenwet. Assen, Van Gorcum and Comp. N.V., 1957. 305 pp.

This work is devoted to a study of the Netherlands Trade Councils Act of 1933 and its application in the building industry. It was Parliament's intention that these councils should operate as a forum for consultation and co-operation between employers and workers in the various branches of industry. Their development, however, was slow in the years before the Second World War : by 1940 only 21 councils had been set up. Though it was not adequately applied, the Act nevertheless had an undeniable influence on the march of ideas in the field of labour-management relations, thus preparing the ground for the passing, in 1950, of the Industrial Organisation Act.

Manpower.

AMERICAN MUTUAL LIABILITY INSURANCE COMPANY. *Physical Abilities to Fit the Job.* How to determine a worker's physical abilities and relate them to job demands safely and productively. Boston, Massachusetts, 1956. 145 pp.

COMMITTEE ON LABOR AND PUBLIC WELFARE, United States Senate. *Studies of the Aged and Aging.* Selected Documents, Vol. I. Federal and State Activities. Washington, 1956. xvi+309+xix pp.

This is the first of a series of volumes presenting documents selected by the staff of the United States Senate Committee on Labour and Public Welfare for the use of the Committee in its analysis and evaluation of proposed legislation related to the needs of the aging and aged.

The seven documents it contains include the reports of two conferences on aging held jointly by federal and state agencies in 1952 and 1956 ; a descriptive inventory of federal government programmes for the benefit of older persons ; the text of a Bill of objectives for older people and a programme of action in the field of aging, setting forth recommendations made as a result of a one-year survey on older citizens conducted by the Council of State Governments in 1955 and 1956 ; a study of the organisation and activities of the official state groups concerned with aging ; and a summary of recommendations on problems of the aging compiled from reports of the state agencies in question.

INS, German von. *Das Problem der Überbeschäftigung in der Nachkriegszeit.* Inaugural-Dissertation zur Erlangung der Würde eines Doktors der Staatswissenschaften der Philosophisch-Historischen Fakultät der Universität Basel. Basle, 1956. 111 pp.

Thesis on the problem of overemployment in the post-war period.

MULLINNIX, Kathryne E. (compiled by). *Louisiana and Child Labor.* Baton Rouge, Louisiana Youth Commission, 1956. 138 pp.

In Louisiana, as elsewhere in the United States, the law regarding child labour has been the object of attacks in recent years, mainly on the ground that it keeps children unduly out of suitable employment. It is with this question that the present study is concerned. The conclusion it reaches is

that attempts to undermine the present law should be vigorously rejected. Certain recommendations are made on the way in which the law and its administration could be further strengthened. The necessity of developing school curricula satisfying the educational needs of adolescents is also stressed.

STONE, C. Harold, and KENDALL, William E. *Effective Personnel Selection Procedures*. London, Staples Press Limited, 1957. x+433 pp. 42s.

This book, first published in the United States in 1956, aims to bring together in a compact and practical form information bearing on personnel selection as it interests the large company.

In the course of a comprehensive and clear exposition of the principles and procedures involved, the authors draw extensively on the practical experience of a number of large American employers. They stress the need for a " company employment policy ", and deal successively with recruitment policy, the selection process, personnel testing and induction of new employees.

In the first part, some attention is given to the importance of job analysis and the means of gathering information for compiling job descriptions. The forecasting of manpower requirements is dealt with, and the role of employment services, both public and private are mentioned. A section on the reaction of prospective employees to the usefulness of employment services is most interesting, but might well have included more detailed reference to the role of public employment services in assisting company personnel departments through the preselection of employees.

The sections on the compilation of application forms, the screening of applicants, employment interviews and psychological and other tests are of particular interest.

UNION DES INDUSTRIES MÉTALLURGIQUES ET MINIÈRES. *Ingénieurs et cadres supérieurs. Situation actuelle et prévision des besoins dans les industries des métaux*. Paris, 1957. 120 pp.

A compilation of the results of an inquiry carried out in 1956 by the Union of French Mining and Metallurgical Industries in 500 firms, comprising some 1,300 plants and representing a total work force of about 615,000 people. Generally speaking, the survey shows that while immediate needs for engineers and senior supervisors in the industries concerned are relatively slight, they will, on the other hand, assume serious proportions over a more or less lengthy period. The inquiry enabled these personnel requirements to be assessed in terms of the training required (scientific, commercial, legal or literary training, and self-education), in terms of functions (management, administration, sales, laboratories, design and research, manufacturing and maintenance) and in terms of the branch of industry (iron and steel, foundry work, motor vehicle construction, engineering, aircraft construction and electrical engineering).

Migration.

CONFERENCE ON THE REFUGEE PROBLEM. *The Refugee Problem, Today and Tomorrow*. Palais des Nations, Geneva, May 27-28, 1957. A Conference called by the Conference of Non-Governmental Organizations Interested in Migration and the Standing Conference of Voluntary Agencies Working for Refugees in Association with the Office of the United Nations High Commissioner for Refugees and the Intergovernmental Committee for European Migration. Geneva, 1957. 64 pp.

MINISTERIE VAN SOCIALE ZAKEN EN VOLKSGEZONDHEID, Netherlands. *Emigratie 1956*. The Hague, Staatsdrukkerij- en Uitgeverijbedrijf, 1957. 212 pp. Summaries in English.

This is the fourth of the reports published annually since 1953 by the Ministry of Social Affairs and Public Health on the subject of emigration

from the Netherlands and the activities of public and private Dutch organisations concerned with immigration.

The report contains information on the migration movements to the United States following the passing of the Refugee Relief Act, 1953, in the latter country, the renewal of the Netherlands-Australian Migration Agreement, the cost of emigration, the sociological investigation of reasons for emigrating, the Hungarian refugee problem and assistance to older persons wishing to emigrate. The report also contains a statistical section embracing various aspects of Netherlands migration in 1956, which shows that net emigration totalled 11,138 persons, whereas the figure for the previous year was only 5,198.

Vocational Guidance and Training.

CONTACTGROEP OPVOERING PRODUCTIVITEIT. *Opleiding van volwassenen in de bouwvakken in Frankrijk.* Rapport Studiegroep Industrie. The Hague, 1957. 54 pp. 3.50 florins.

Vocational training of adults in the building industry in France.

QUEF, Pierre. *L'apprenti, cet incompris.* Paris, Editions Lamarre, 1957. 112 pp. 900 francs.

Impressed by the importance of the psychological and social problems that determine the attitude of apprentices to work and influence the results of vocational training, the author has endeavoured, by drawing on his own observations of large numbers of apprentices, to single out certain of the specific and typical traits of their personality which must be reckoned with if methods of apprenticeship are to be fully efficient, and by his personal testimony to contribute to filling a gap in what is known of this class of young people.

SCHAIRER, Reinhold. *Technische Talente. Lebensfrage der Zukunft.* Düsseldorf, Cologne, Eugen Diederichs Verlag, 1956. 36 pp.

An account, supported by statistical data, of the efforts made in selected highly industrialised countries to recruit and train technical manpower in response to the increasing demands of economic expansion and technical progress. Emphasis is laid by the author on the fact that, to the internal requirements for highly trained technical personnel, must be added the needs of projects of technical assistance to economically underdeveloped countries.

SONIN, M. J. *Die betriebliche Ausbildung von Facharbeitern.* Übersetzung aus dem Russischen. Zweite ergänzte Auflage. Berlin, Verlag Die Wirtschaft, 1956. 202 pp. DM 6.50.

This translation of a study first published in Russian is intended for wide circulation among government, party, industrial and trade union circles as well as university students concerned with questions of in-plant training and upgrading of skilled industrial workers. Study material from the Economic Institute of the Academy of Sciences of the U.S.S.R. has been used in its preparation.

Three chapters deal with the planning, organisation and forms of in-plant training and upgrading of skilled workers in the U.S.S.R. Economic decentralisation is expected to influence the future development of in-plant training, upgrading and retraining.

A special chapter outlines the importance attached to adapting in-plant training to the needs of technological progress, which calls for an increasing number of qualified personnel with a higher general education and a less specialised technical or vocational training. In particular new methods are being sought for on-the-job training of workers for more than one trade or speciality.

In a further chapter it is concluded that efforts to raise the cultural level and technical qualifications of the working class have shown satisfactory results, but must continuously be improved.

TRAXLER, Arthur E. *Techniques of Guidance.* Revised edition. New York, Harper & Brothers, 1957. xiii+374 pp.

This is a thoroughly revised and enlarged edition of the book written by the author in 1945. The concept of guidance is taken in a broad sense to cover educational as well as vocational guidance and guidance concerned with adjustment problems, but all this within the educational system of the United States. The main emphasis throughout is on the analysis of the individual. One of the twenty-one chapters is, however, devoted to opportunities for young people and to sources of information concerning occupational opportunities.

After a comparatively brief discussion of general matters concerning guidance, the author goes on to describe and discuss in detail the various techniques of guidance. A large number of forms, charts and formulas connected with these techniques, which are either in current use in the United States or are suggested by the author, have been included. Short chapters are devoted to guidance in the adjustment of individuals, counselling as a learning function, group work in guidance and guidance and placement of persons whose education has been interrupted. The book contains a selected reading list for the counsellor on subjects such as child psychology, clinical counselling, educational guidance, vocational guidance, testing, case studies, cumulative records and bibliographies.

Rehabilitation.

AMERICAN FOUNDATION FOR THE BLIND. *Training and Employment of Deaf-Blind Adults.* Report on a workshop held in New York City, February 6-9, 1956. No. 4, Group Reports. New York, 1956. 32 pp. 45 cents.

MACFARLAND, Douglas Cortland. *A Study of Work Efficiency of Blind and Sighted Workers in Industry.* Research Series No. 5. New York, American Foundation for the Blind, 1956. 58 pp. 70 cents.

NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS. *Proceedings of the Second Institute on Rehabilitation Centers, 1956.* Introduction by Jayne SHOVER. Chicago, Illinois, 1956. 29 pp. $1.

RITTER, Charles G. *Technical Research and Blindness. Some Recent Trends and Developments.* New York, American Foundation for the Blind, 1956. 40 pp. 50 cents.

Social Security ; Public Health.

COMMISSION TO STUDY, EXAMINE AND INVESTIGATE THE COST OF WORKMEN'S COMPENSATION, State of New York. *Costs, Operations and Procedures under the Workmen's Compensation Law of the State of New York.* Report to Honorable Averell Harriman, Governor of the State of New York. New York, 1957. iii+142 pp.

GROS, Paul, and ELWERT, Karl. *Handwörterbuch des Arbeits- und Sozialversicherungsrechts für die tägliche Praxis.* Schriftenreihe zum Arbeitsrecht, herausgegeben von Friedrich SITZLER. Stuttgart, Forkel-Verlag, 1956. 503+120 pp.

A practical handbook of labour and social security law in the Federal Republic of Germany.

OFICINA IBEROAMERICANA DE SEGURIDAD SOCIAL. *Primer ciclo de conferencias de intercambio técnico.* Madrid, Instituto de Cultura Hispánica, 1956. 144 pp.

Sozialplan für Deutschland. Auf Anregung des Vorstandes der Sozialdemokratischen Partei Deutschlands vorgelegt von Walter AUERBACH, Edmund BRUCH usw. Berlin, Hanover, J. H. W. Dietz, 1957. 208 pp.

Under the auspices of the Social Democratic Party of Germany several authors have elaborated in this book a detailed plan for a far-reaching social reform in Germany. Suggestions are made for a new and co-ordinated system of medical care with particular regard to preventive measures, as well as of other branches of social security, social assistance, and public and private welfare, special attention being devoted to old-age pensions for workers and self-employed persons.

STEIN, Bernhard. *Der Familienlohn. Probleme einer familiengerechten Einkommensgestaltung*. Sozialpolitische Schriften Heft 5. Berlin, Duncker & Humblot, 1956. 268 pp.

Deals with the fundamental problems of family allowances in the light of the schemes in operation in the Federal Republic of Germany, France, Great Britain, Sweden and the U.S.S.R. The author considers the economic repercussions of family allowances and makes proposals for an improvement of the present German scheme.

TURNBULL, John G., WILLIAMS, C. Arthur, and CHEIT, Earl F. *Economics and Social Security*. Public and Private Measures against Economic Insecurity. New York, The Ronald Press Company, 1957. vii+539 pp. $6.

WERMEL, Michael T., and BEIDEMAN, Geraldine M. *Supplemental Unemployment Benefit Plans*. Their Economic and Industrial Relations Implications. Pasadena, California, Institute of Technology, 1957. 51 pp.

Agriculture.

DUMONT, René. *Révolution dans les campagnes chinoises*. Paris, Editions du Seuil, 1957. 462 pp.

The author paints a vivid and detailed picture of agriculture in the various Chinese provinces he has had occasion to visit. He goes on to emphasise the traditional human environment, the overpopulation (with an average of 4.5 peasants per hectare, or 1.8 per acre, of cultivated land) and the overcultivation of the soil. He then describes the agrarian reform and the new atmosphere it has brought about in the Chinese countryside, once fated to periodic famine. Speaking of the creation of co-operatives, a halfway house between semi-feudalism and socialism, he points out that an intensification of adult education and vocational training has everywhere preceded the introduction of machinery, which in any case is bound to be a very lengthy process.

The closing chapters are devoted to monographs on a number of typical regions and co-operatives.

The work is followed by several appendices giving statistical data on Chinese agriculture, its make-up and its output.

ЕВСЕЕНКО, П. М., and САМОЙЛОВ, В. С. *Организация социалистических сельскохозяйственных предприятий*. Учебники и учебные пособия для сельскохозяйственных техникумов. Moscow, Сельхозгиз, 1957. 424 pp. 10.60 roubles.

Organisation of socialist agricultural undertakings, by P. M. Evseyenko and V. S. Samoilov.

GAD, Holger. *Befolknings- og Arbejdskraftproblemer i Dansk Landbrug*. II: *Arbejdskraftproblemer i Dansk Landbrug*. Studier fra Aarhus Universitets Økonomiske Institut, Nr. 13. Aarhus, Universitet, 1957. 245 pp.

Contains an analysis of the Danish agricultural labour market from 1935 to 1955 and of cost, input and productivity of agricultural labour from 1925 to 1955, its aim being to describe developments in the agricultural labour market during a period of change from mass unemployment to full employment, and to explain the factors affecting the labour market during this period. The analysis, which deals only with wage earners and adults

working on their parents' farms, is based on official Danish statistics and the yearly farm accounts reports of the Institute of Agricultural Economy.

Over the period 1935-55 the number of male workers in agriculture decreased by 40 per cent. and that of female workers by 60 per cent. Young unmarried farm workers account for the whole of this decrease, whereas the number of married permanent workers in agriculture has increased by more than 40 per cent.

The analysis indicates that wages in agriculture have increased much more than wages for similar work outside agriculture over the same period. An examination of the relation between wages and employment shows that the changes that have taken place in agriculture and in other sectors can be fully explained by referring to changes in the economic conditions governing supply and demand on the agricultural labour market; the demand curve being influenced primarily by changes in agricultural prices, and to a smaller extent by prices of means of production other than labour, whereas the supply curve is influenced essentially by changes in wage levels and by employment facilities outside agriculture. An examination of productivity of labour in agriculture shows that production per man-hour has gone up by 50 to 75 per cent. in the various farm groups during the period 1935-54.

HOFSTEE, E. W. *Rural Life and Rural Welfare in the Netherlands.* The Hague, Ministry of Agriculture, Fisheries and Food, Division of Documentation, 1957. xviii+364 pp.

This book was written as a contribution to the documentation of the European Conference on Rural Life held in April 1957 in Bad Godesberg under the joint sponsorship of the F.A.O. and the I.L.O. It begins with a brief account of physical, economic, social and demographic conditions in the Netherlands; this is followed by a detailed study of the development and the present situation of agricultural production, marketing, transport and communication, credit facilities, labour market, social and political groups and organisations, nutrition, housing and health, education and vocational training and public services of all kinds.

The second part consists of an assessment of the influence of these conditions on the well-being of the rural population. Particular attention is devoted to standards of health, levels of living, conditions of work and satisfaction in work, mental and physical skills, social integration and cultural adjustment, security and protection of person and property, security of income and emotional security.

The book is well illustrated with numerous maps, tables and photographs, and offers a wealth of facts and data pertaining to the various aspects of rural welfare in the Netherlands. It draws a vivid picture of the conditions of work and life of the rural people, of their own efforts to improve their lot and of the role played by the State in bringing about a richer and better life in the country.

INDIAN SOCIETY OF AGRICULTURAL ECONOMICS. *Readings in Land Utilisation.* Vol. 5 of Readings in Agricultural Economics Series. Bombay, 1957. x+234 pp. 10 rupees.

ЦЫНКОВ, М. Ю. *Экономическая эффективность отраслей в колхозах.* (Опыт изучения) Moscow, Сельхозгиз, 1957. 94 pp. 1.25 roubles.

Economic efficiency of the various branches of collective farms, by M. Tsynkov.

Co-operation.

BAILEY, Jack. *Co-operation and Modern Socialism.* London, Co-operative Party, 1957. 16 pp. 6d.

CENTRAL COMMITTEE FOR CO-OPERATIVE TRAINING, India. *Co-operative Training.* Facilities provided by the Central Committee. Bombay, Reserve Bank of India, 1956. iv+174 pp.

The Co-operative Directory. Manchester, Co-operative Union Ltd., 1957. xvi+622 pp.

Records details of distributive, wholesale, productive and special co-operative societies in the United Kingdom.

LEYVAL, A. P. *La coopération agricole en Algérie*. Algiers, Imp. Vve Bringau et Cie, 1957. 379 pp.

ERRATUM

1957—Vol. LXXVI

No. 5, November. " Workers' Education in the United States." Page 428, second paragraph, second and third sentences. The text of these sentences should be amended to read as follows: " One of these was the Southern Summer School for Women Workers in Industry (subsequently the Southern Summer School for Workers in Industry) founded in 1927; this school, though not connected with any college or organisation, held yearly sessions on the campuses of several. Among others were Commonwealth College . . . [the remainder without change] ".

VOLUME LXXVI

Contents

PRINCIPAL ARTICLES

Page[1]

I.L.O. Productivity Missions to Underdeveloped Countries: I . . . 1

The Future of Immigration to South America, by Rev. Fernando Bastos de Ávila, S.J. 30

The Development of Social Security in Burma, 1954-57, by Maung Sein 47

The Maori in New Zealand: A Case Study in Socio-Economic Integration, by Ernest Beaglehole 103

Manpower Planning in Norway, by Thor Skrindo 124

I.L.O. Productivity Missions to Underdeveloped Countries: II . . 139

The Fortieth Session of the International Labour Conference, Geneva, June 1957 217

Social Aspects of European Economic Co-operation, by André Philip 244

Management by the Workers in Poland, by Jan Rosner 257

The Vocational Training of Adults, by E. Rossignol 325

The Measurement of Underemployment 349

Physical Problems in the Employment of Aging Men, by F. Le Gros Clark 367

Workers' Education in the United States, by Amy Hewes 423

Erratum 619

Changes in European Peasant Farming, by Doreen Warriner . . . 446

[1] Pp. 1-101: No. 1, July.
103-215: No. 2, Aug.
217-323: No. 3, Sep.
Pp. 325-421: No. 4, Oct.
423-526: No. 5, Nov.
527-622: No. 6, Dec.

Page [1]

Recent Trends in the Yugoslav Co-operative Movement, by M. VUČKOVIĆ 467

Social Problems in Mines Other than Coal Mines 527

The Trade Union Movement Faces Automation, by Alfred BRAUNTHAL 540

REPORTS AND INQUIRIES

Recent Productivity Trends in Western European Manufacturing Industry 61

Obstacles to Labour Mobility and Social Problems of Resettlement: A Survey by the European Coal and Steel Community 72

Collaboration between Public Authorities and Employers' and Workers' Organisations 167

The Coal-Mining Safety Conference of the European Coal and Steel Community 188

Recent Trends in Industrial Wages 194

The Ninth International Conference of Labour Statisticians 278

Inter-Territorial Migrations of Africans South of the Sahara 292

Supplementary Pension Schemes in France 384

Treaty Establishing the European Economic Community 400

Development Planning in Taiwan 479

National Sickness Insurance in Sweden 496

Wages and Related Elements of Labour Cost in European Industry, 1955: A Preliminary Report 558

Shortage of Highly Qualified Engineers and Scientists 588

BIBLIOGRAPHY

Publications of the International Labour Office . 84, 311, 407, 513, 604

Publications of the United Nations and Other Intergovernmental Organisations 86, 201, 311, 514, 605

Other Publications 88, 201, 312, 407, 514, 605

[1] Pp. 1-101: No. 1, July.
103-215: No. 2, Aug.
217-323: No. 3, Sep.
Pp. 325-421: No. 4, Oct.
423-526: No. 5, Nov.
527-622: No. 6, Dec.

STATISTICAL SUPPLEMENT

	Page [1]
Retail Prices of Selected Consumer Goods, October 1956	2
Hourly Wages of Adult Wage Earners in 41 Occupations, October 1956	2, 30
Monthly Salaries and Normal Hours of Work per Week of Employees in Selected Occupations, October 1956	51
Changes in the Tables	71, 85, 127, 141, 155
Indices of General Level of Employment	87, 158
Indices of Non-agricultural Employment	88, 159
Indices of Employment in Manufacturing	90, 161
Unemployment Statistics	58, 73, 94, 128, 143, 165
Consumer Price Indices	62, 77, 98, 132, 147, 169
General Level of Wages	114, 185
Wages in Manufacturing	119, 190
General Level of Hours of Work	124, 195
Hours of Work in Manufacturing	125, 196

[1] Pp. 1-69: No. 1, July.
71-84: No. 2, Aug.
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